

# FLIGHT

The  
AIRCRAFT  
ENGINEER  
&  
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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## Flight

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The 8-page Index for Vol. XII of "FLIGHT" (January to December, 1920) is now ready, and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C. 2. Price 1/- per copy, post free.

## DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:

Mar. 17	...	Lecture, "Flying Boat Construction," by Capt. D. Nicholson, before R.A.S.
Mar. 20-22	...	Aero Club of France Grand Prix. 2nd stage
April 13-20	...	Monaco Seaplane Meeting
April 20-22	...	Aero Club of France Grand Prix. 3rd stage
May	...	Seaplane Contests on Lake Garde, Italy
June 1	...	Entries Close for Schneider Cup
June 10	...	Race, Lugo-Trieste-Triente-Lugo
Sept. 4-11	...	Brescia Races
Sept. 5	...	Pulitzer Trophy, Detroit, U.S.A.
Sept.	...	Gordon Bennett Balloon Race
Sept. 30	...	Provisional Date for Schneider Cup

## EDITORIAL COMMENT



It cannot be said that there is much satisfaction to be gained from a close reading of the debate on the Air Estimates. Mr. Churchill, to our way of thinking, told the House and the country very little of past history with which we are not already painfully familiar, and in dealing with the future, held out very little hope of that encouragement for which we were told, two years ago, to look.

In a word, civil aviation, in so far as any interest the Government have in it, has been sentenced to death. If it eludes execution of the sentence it will be through its own efforts and not by reason of any eleventh hour reprieve given by Mr. Churchill and his colleagues of the present Cabinet.

Hitherto we have numbered ourselves among the supporters of the present Air Minister. We have recognised to the full that Service aviation has owed a great deal to his prescience and the skill with which he has presented his case to the Cabinet. It is a well-worn theme now, but, whatever we may think of the manner in which Mr. Churchill is administering his charge now, we cannot forget that it was due to his imagination and forethought that the Navy possessed any sort of aerial arm at all when the War broke out. But after we have made every allowance and given every credit to him for his past services to aviation, there is no possible way out of laying a grave indictment to his charge, upon which he will have to stand his trial before the bar of history, if indeed the reckoning does not come more swiftly than might be thought now. His speech in defence of his policy stamps him as a Minister with but a single ideal, and that ideal, we submit, a completely wrong one. Right through the speech we listen to the soldier rather than to the statesman. He ignores utterly the fundamental fact that it is to the building up of a great reserve available for absorption into the active Air Force that we should in fact look for our future security from aerial attack. He ignores again the dictum of his own Controller of Civil Aviation, who has said that "The nation which is strongest in commercial air traffic will be the strongest also in the aerial warfare of the future." That opinion, as we know, is backed by every responsible authority who

has seriously studied the subject. Indeed, its truth is so self-evident as to be axiomatic.

Yet we look in vain for any signs of clear appreciation of the fundamental factor in air policy—that it is only by the direct encouragement of aerial traffic on the commercial side that a nation can build up that margin of air power which will render it immune from hostile attack. France recognises it, and we know the measures she is taking to ensure a lead in commercial flying. Germany also recognises it, and we have been told a good deal about her plans for the future. America is well to the front, and is encouraging commercial aviation by all and every means. Only in this country is there an apparent failure to grasp the facts of the situation, and then that failure is only by the Government, led by its responsible adviser, the Air Minister. Outside the Government it is only too well recognised whither our present policy is leading us. There is absolute unanimity of the Press on the subject. Indeed, we cannot recollect any previous occasion or problem upon which the Press of the country has spoken with a more definite and united voice. There is not a dissident. Public opinion is as unanimous. Yet we still have no policy!

#### A Wrong Conception

The truth of the matter is that Mr. Churchill appears to have a totally wrong conception of aerial policy, and he has been led into that by the defects of his undoubtedly brilliant qualities. He is much more the descendant of the great soldier-duke, Marlborough, than of his father the statesman. He regards air policy almost entirely from the point of view of the soldier. That is obvious from the tenor of his speech. He spoke almost caressingly of the score of training establishments, where officers and men of the R.A.F. are to be instructed in every branch of air war and initiated into the refinements of scientific man-killing from the air. From beginning to end there stood out the justification of the fighting man. Yet when he came to discuss civil aviation, upon which the fighting Service must depend for its reserves, the question was slurred over as though it were of no account. We are not climatically well situated for the development of civil aviation! He drew contrasts between the inconvenience of travel by air, with attendant journeys to terminal aerodromes, and travel by motor-car, which was a door-to-door business. Even the train, which carries its passengers into the heart of towns and cities, is to be preferred to aircraft! Certes, the future of civil aviation is not worth regarding!

Mr. Churchill did promise a Committee, including representatives of the aircraft industry, to devise alternative methods to meet the competition of French and Belgian subsidised services across the Channel—and then knocked the bottom out of the promise by saying very definitely indeed that there must be no commitments that would carry the allocation for civil aviation beyond the £1,000,000 already voted for its "encouragement." That does not take us far, since £940,000 of this is spent on salaries of staff, messengers, charwomen and "services," and only a beggarly £60,000 is available for encouragement of the industry. We regret exceedingly to have to record the opinion that, after all, Mr. Churchill is the wrong man for the Air Ministry. He has had his chance, and has failed to realise the true needs of the situation. The sooner he hands over to a Minister

who can approach the subject from a different angle of view to that adopted by the soldier pure and simple, the better it will be for the future of British air power, civil and military. In any case, it is impossible that a single Minister should fulfil the dual rôle he is trying to enact now. So much is certain, so why the Prime Minister delays making an announcement of his intentions regarding the Air Ministry baffles the ordinary person. Is Mr. Lloyd George never going to drop the habit of waiting to see what is going to happen tomorrow?

#### The Fate of the Airships

What is to be the ultimate fate of the rigid airships? The Air Minister announced during the discussion of the Estimates that they were at the disposal, free, gratis, and for nothing, of any group of commercial men who would take them over under appropriate guarantees to work them on passenger routes. The alternative seems to be to scrap them altogether, since the information has been vouchsafed that the Navy for the future intends to replace airships by heavier-than-air craft. It seems a pity to let these ships fall to pieces, or to break them up for the sake of the scrap metal and the fittings that could be recovered. The loss to the taxpayer would be less if some workable alternative could be discovered. Why not, therefore, sell them to the Germans? They at least would appreciate the value of seven modern airships, which could be put straight on to passenger and goods traffic. Especially would they value the return of "L.64" and "L.71," which were handed over to us under the terms of the Peace Treaty. The money the Huns would pay us—doubtless in cash—could be used for the purchase of a brand-new uniform for the R.A.F.! Everybody would be pleased, particularly our late enemies on the farther bank of the Rhine.

Seriously, however, it is to be hoped that some strenuous effort will be made to secure that these fine craft are put to some useful purpose. Very few outside the handful who have been actively associated with the airships branch during the past few months are aware of the highly valuable data that have been collected during the recent experiments at Pulham. It is common knowledge that the principal disability which has had to be encountered in connection with the use of the big airship for commercial purposes is the great expense of providing it with housing accommodation. A shed that costs a quarter of a million to build is not precisely a tempting accessory to contemplate when a determination has been reached that the airship, *qua* airship, is a craft of commercial possibilities. Even when the shed has been built and the expenditure faced, there still remains the trouble that there is serious danger in housing and unhousing the craft it has been constructed to accommodate. The Germans could tell more than one story of a Zeppelin wrecked while being manoeuvred into or out of its shed, while our own experience with "R.34" the other day is informative in the same direction.

There remains now no room for doubt that the mooring mast is the real solution of the difficulty. At Pulham one of the rigids has been moored out to the mast which has been built there every day and night since January 27. She has been unmoored and has flown up to the mast every day without difficulty or mishap, whatever the force or direction of the wind has been—and there have been winds with a velocity up to about 40 miles an hour. This method of mooring-out has exceeded the most sanguine





## Aviatic Types—Civil and Otherwise

THE DESIGNER

expectations, and, as we have said, it seems to be the solution of the "housing problem" in so far as it concerns airships.

That safely out of the way, the next consideration is whether or not airships can be operated as a paying proposition when used for the conveyance of passengers and goods. As to that, we have the experience of the German lines, which are said to have paid well before the War, while the two comparatively small ships that have been working recently are also said to be commercially successful. Our own airship experts say they can actually compete with the steamship lines between England, Egypt and India. They say they can carry passengers to India in about five days for the fares charged by the steamer companies, and show a handsome profit. If they can really make good their figures, there should be a strong temptation to commercial groups to find the money to take over the ships and run them. On the face of it, the bargain is a good one. They pay nothing for the ships, and are only asked to give adequate guarantees that they will actually operate them. That is so far as our information goes. There may, of course, be more behind the offer of the Government than meets the eye, in which case the proposition must be judged upon its actual merits.

#### Civil Aviation Can Pay

In connection with the discussion of the future of civil aviation, there is one aspect which should be kept well in view. The opponents of a subsidy to the industry ask of what use it is to attempt to bolster up a movement which is commercially unsound from the start, and which can never show a return to the shareholders who may be so misguided as to risk their money in it. Now, this is a complete fallacy. Commercial aviation *can* pay—it *does* pay. The cross-Channel services, operated with converted war machines for the most part, paid their way and showed a profit—small, it may be, but nevertheless a profit. With the machines especially designed for commercial purposes which are coming along now it will be possible in the future to conduct services not only at a profit but at a handsome one at that.

The question will naturally be asked: If this is true, then why does civil aviation require subsidising by the State? The answer is not far to seek. It requires assistance over the lean time there must be while the public is being educated up to the true possibilities of aerial transport. Rome was not built in a day, nor can the public be induced to break away from habits and traditions of travel simply on the bare fact that a new method of transport has been perfected. The process of change-over from steamer and railway travel to the air must be gradual—more gradual than any similar change has ever been in the past, because we are now asking people to entrust themselves and their property to a new medium altogether. They are perfectly well used to travel by sea and land—they have travelled for centuries over the surface of both—but the air is a different matter entirely.

Much educative work will have to be done. Clubs and societies must be founded in every great centre of population whose purpose will be to instruct the travelling public on subjects connected with air travel. More active work, in the shape of what we will call propaganda flights, will have to be undertaken. In a word, a truly comprehensive scheme of education must be worked for all it is worth. Then, gradually

at first, but gathering volume as time goes on, we shall see public confidence in air travel grow until it will be as much a matter of course for the traveller to go by air as it is for him to take train or motor-car to cover his journey now. Then the industry will not only be able to do without extraneous help, but it will be one of the greatest revenue-producers in the country. But it cannot live in the face of heavily-subsidised foreign competition unless the State is prepared to do as much for a vital industry as France, Germany, Holland, Belgium and the rest, with more forethought than we seem to possess, are doing now.

#### The Future of Air Power

One of the most interesting, as well as the most valuable, contributions to the discussion on the future of air power is the series of articles on the subject recently contributed to the *Daily Telegraph* by Gen. Brancker. He naturally approaches his subject from the point of view of the specialist in aerial War, believing thoroughly in the new arm and that it is destined to usurp the functions, as we have understood them in the past, of armies and particularly of fleets. As to the latter, he is quite uncompromising and says plainly that, in his view, the first duty of the Air Force of the future will be the attainment of the command of the air—which will include the surface of the sea—and, by virtue of that command, to protect our own soil and our commerce, while attacking that of the enemy.

Naturally enough, that is not the view which is held by naval experts, either in this country or abroad. In endeavouring to arrive at a conclusion based upon reason, we must bear in mind that every development of physical science has been initially condemned by the "experts" of the period. The Navy was to be ruined by the advent of the steam engine! The breech-loading gun was condemned and the Navy actually went back to the muzzle-loader after ships had been armed with the more modern weapon. It was easier in those days to retrograde than to improve what was a valuable invention, even though crude in its application. The torpedo was of no account and could never be reliable. As to the submarine, the attitude of the experts was summed up in what was said by one of very senior rank to Admiral—then Lieut.—Sueter, who was a pioneer of the submarine as he was of aircraft: "Very pretty, but nothing but a toy." The army authorities condemned motor transport, because it was unreliable and would frighten generals' horses! Aviation itself was damned with bell, book and candle right up to the eve of the War. Yet we have seen each of these inventions and innovations develop into a decisive factor in War. The submarine nearly beat us at sea. The aeroplane made it possible for us to win on land. It is certainly within the mark to claim that it was the Allies' air supremacy that made the final break-through and the defeat of Hun hordes a practical possibility.

Yet we are still slow to learn, and if we are to judge by the present attitude of the Government towards aviation, we are content to ignore the lesson so bitterly learnt and to allow "economy," save the mark, to stand in the way of security. Fortunately, there are still those who, like Gen. Brancker, add an abiding faith in aircraft to the ability to state the case in an informative, educative manner. It is only by the creation of a sufficiently weighty public opinion that we shall get the Government to do anything.

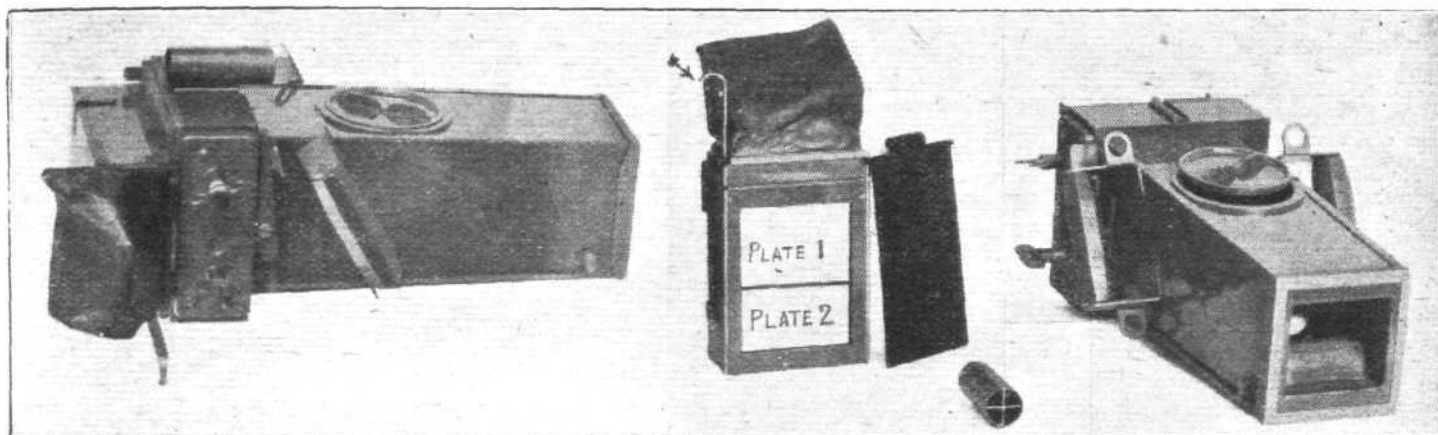


## EASTMAN KODAK AERIAL CAMERAS

QUITE apart from all military considerations, there are undoubtedly vast possibilities in Aerial Photography, and many and various are the uses to which the combination of aircraft and camera may be put. Ordnance survey is one of the most important, and the efficiency and accuracy of map-making by means of aerial photographs has been demonstrated during the past few years. Then, from the more commercial point of view, there is the photography of estates, buildings, factories, etc., for which there must always be a demand, as when done from the air the results are much more convincing and more complete than similar work executed from *terra firma*. Already excellent aerial photographic work has been carried out in Canada and America in connection with ranches, forestry and the like.

cast aluminium, and the "cone" of sheet aluminium. An "inspection" door is fitted in the cone, giving access to the inner element of the lens. The direct vision sight tube may be fitted either above or below the camera, according to the operator's requirements, a groove being provided top and bottom of the camera body for this purpose.

At the top of the camera body, on the right-hand side, is a key for setting the focal-plane shutter, and the latter is released by a very "comfortably" placed thumb-lever immediately behind the right-hand grip. Exposures varying from  $1/120$  to  $1/435$  of a second may be made by adjusting the tension of the focal-plane shutter—which has a fixed aperture—by means of a second key placed below the setting key.



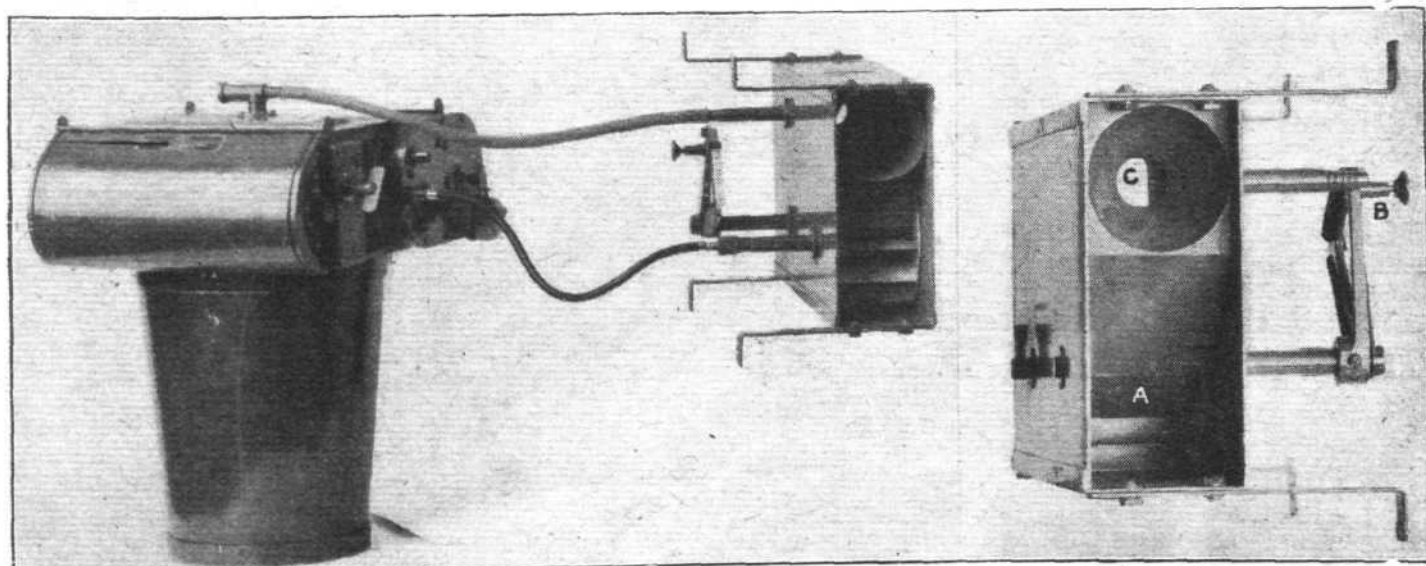
THE EASTMAN KODAK A-1 AERIAL CAMERA, HAND TYPE: The complete camera is shown on the left, and in the centre is the plate magazine and changing bag (the operating lever indicated by the arrow). The view on the right shows the lens exposed by the safety shutter.

It is only natural, having attained a commanding position of many years' standing in the sciences of photography, that the world-wide known firm of Eastman Kodak should associate itself with aerial photography. With the experience gained in connection with war work—and "Kodak's" did much of the necessary experimental work in America—they are able to place on the market some aerial "Kodaks" that should prove to be very useful and efficient for peace-time aerial work.

Two of these cameras, the A-1 and the K-1, are shown in the accompanying illustrations, whilst the following brief particulars of both may be of interest. Model A-1 is a hand-held and operated camera for plates or cut films, size  $5 \times 4$  ins. It is light, compact, and simple in operation, and the two hand-grips—one on each side—give, it is claimed, considerable control. The body of the camera is made of

The lens fitted to this camera is an Eastman 10-in. "Hawk Eye," with a fixed aperture of  $f. 4.5$ . Accurate adjustment at infinity focus is permitted by the standard mount being provided with a running thread and setscrew. As a protection against exposure of the lens to fog, mist or dirt, or against fogging the plate when the shutter is reset, a safety shutter is mounted in front of the lens. The initial pressure on the thumb-lever release opens this shutter just before the exposure is made. This shutter is readily removed for the purpose of refocussing or cleaning the lens. It will be noticed that lugs are provided on the hand-grips for attaching shoulder straps, when required.

A simple and ingenious plate magazine is provided for 12 plates or films. This is shown in one of the accompanying illustrations, from which it will be seen that at the side of the magazine box is a hooked lever. Pulling this lever out to



THE EASTMAN KODAK K-1 AUTOMATIC AERIAL CAMERA: The camera (on the left) is shown connected up to the paddle-wheel wind motor, whilst on the extreme right is a rear view of the wind motor, showing the damper, A, its control lever, B, and the Venturi tube, C.

its full extent draws the exposed plate into the changing bag—seen at the end of the box—when the plate may be manoeuvred into place down behind the others, a procedure quite easily accomplished, and assisted by guides inside the magazine. The next plate is, of course, in position ready for exposure.

Another model—the B-1—similar in general design to the above, is also made for roll films only. In this model a handle on the film magazine changes the film and sets the shutter with one turn.

It is in the model K-1 camera that the most interesting features may be found, for this is a design embodying the latest developments in aero-cameras. Although it is entirely automatic in operation its mechanism is remarkably simple. This camera is particularly suitable for photographic mapping, and is constructed to take roll films, giving 100 exposures of 18 x 24 cm. The daylight loading of these films is similar to the orthodox system employed in the ordinary Kodaks, and is an important feature. The camera is suitably mounted in the floor of the aeroplane, and is operated by a wind motor, mounted outside the fuselage, through flexible shafting. The wind motor consists of a paddle-wheel mounted in the lower portion of the metal motor-box, the front end of which is open to the slip stream of the airscrew. Behind the paddle-wheel is a shutter or damper, controlled from within the fuselage, which regulates the air flow past the paddle-wheel and consequently the speed of the latter. From the paddle spindle a flexible shaft transmits the power to one of two connections on the camera body—one for slow speed and one for high speed work. According to the altitude and ground speed of the aeroplane, the interval between exposures is adjusted by means of the damper control of the wind motor.

The camera, which is of metal construction, comprises a "cone" carrying the lens, above which—attached by means of a quick-release joint—is the film box carrying film spools, operating gear-box, and focal-plane shutter. The arrangement of the film spools is much the same as that on the ordinary Kodak film camera, and is clearly shown in one of the accompanying illustrations. The focal-plane shutter, located as close up to the film as possible, is of the one-piece type with a fixed aperture of  $\frac{3}{4}$  in. By adjusting the tension of the blind speeds from 1/90 to 1/310 of a second may be obtained. Below the focal-plane shutter is a safety curtain, which is closed whilst the shutter is being reset and automatically opens as soon as this has been accomplished. The film is shifted ready for the next exposure simultaneously with the

setting of the shutter. A key for hand operation is also provided.

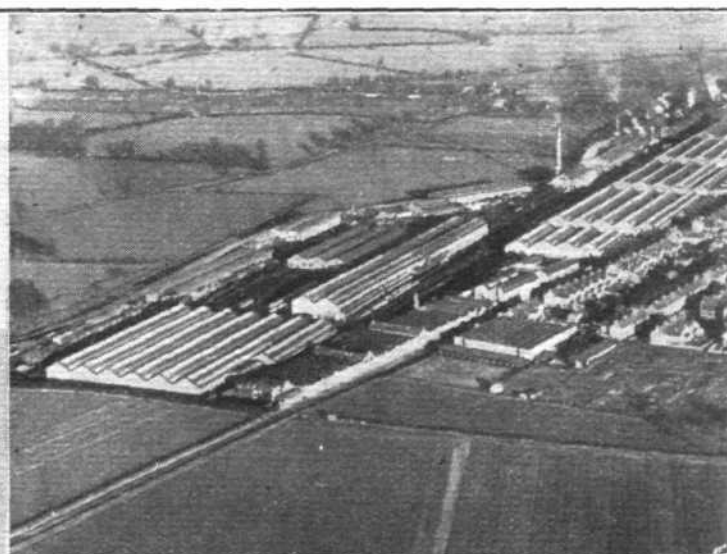
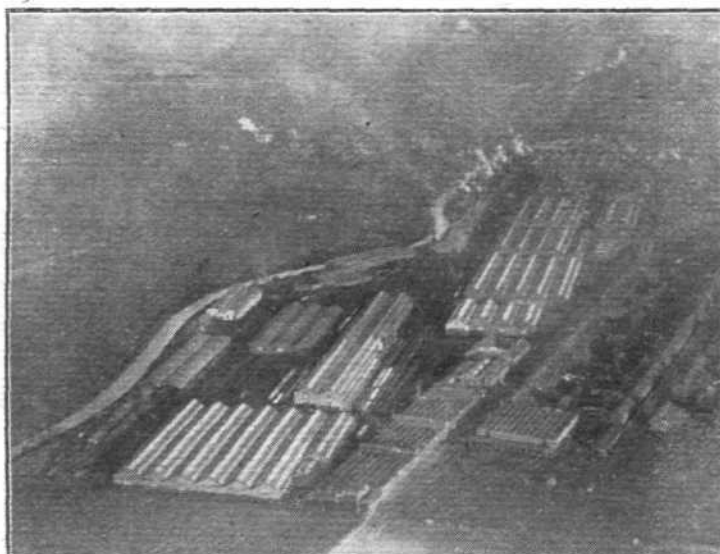
A rather important feature consists of an arrangement whereby the film is held accurately in the recording plane, and is prevented from vibrating. This is achieved by means of a perforated plate, on the inner side of the top cover of the film box, which is connected up with a Venturi tube in



The component parts of the Kodak K-1 Automatic Aerial Camera, showing the vacuum plate in the top right-hand corner, and below it the film box and focal plane shutter. The safety curtain may be seen in the view of the film box (from below) on the left.

the upper portion of the wind motor-box. The suction from the Venturi tube holds the film in close and flat contact with the perforated plate; a release valve being provided to prevent excessive suction.

The lens fitted to the K-1 is a "Hawk Eye" 12-in., or, if required, 20-in. The weight, complete with 100 exposure film rolls, is 44 lbs.



PHOTOGRAPHING AS THE EYE SEES IT : On the left is shown a view from above taken on an ordinary plate (which is colour-blind), and on the right the same view taken, under identical conditions, on a Wratten Panchromatic plate with K-1 filter. In the latter case true colour values are obtained, and the slight haze which prevailed on this occasion is cut out by the filter.



## Finnish Pilots Barred Over Sweden

LAST month the ban placed by the Swedish military authorities upon Finnish air-pilots flying over Swedish territory was re-affirmed, with the result that the Finns' participation in the flying competitions arranged in Norway was practically barred. The Aaland question is at the bottom of the refusal of Sweden, a question which looks like leaving some very sore places for treatment.

At the Christiania meeting on Saturday last, when the air racing took place, the weather was pretty bad and exciting times were experienced. The course for the chief race was a triangular one of 85 kiloms., none of the eight starters completing the specified flying period.

Bestmann, through a seized motor, had to give up, whilst both Lieut. Normann and Capt. Hellesen were injured through accidents.



## OUR NEW LARGE FLYING BOATS

### The Fairey "Titania" and the Vickers-Saunders "Valentia"

JUST now the daily press is very busy with reports of the two new "giant" flying boats which are coming along from the Fairey and Saunders works respectively. As regards the "novelty" of the boats, it may be pointed out that both were designed a matter of somewhere about two years ago, and although large, neither the Fairey "Titania" nor the Vickers-Saunders "Valentia" could be described as gigantic. However, this description should probably be accepted as a compliment, since in the eyes of the daily news sheets any aircraft which is large must be good. The fact of the matter is that both boats are fairly large, in the case of the Fairey one might even say very large. They are, however, on more or less orthodox lines, and may therefore be expected to give a good account of themselves, which is more than one has any right to expect from some of the contraptions now nearing completion in certain other countries. Both boats are designed to the order of the Air Ministry, and consequently we have refrained from making any reference to them in our columns. It appears, however, that the daily papers do not observe such niceties, but cheerfully proceed to tell all they know, which, one soon discovers, is not much. As public reference has now been made to the machines, anyway, it may be permissible to publish a few brief particulars.

#### The Fairey "Titania"

##### Four 600 h.p. Rolls-Royce "Condor" Engines

The Fairey boat is, as regards its boat hull, of Linton Hope design. It will be remembered that the late Maj. Linton Hope was, up to the time of his death a few months ago, connected with the Fairey Aviation Company, for whom he did a good deal of very valuable work. Although his designs have often come in for criticism, there is no doubt that the late Maj. Linton Hope had an "eye" for boat design, and the P type of hull, with its circular cross section and flexible construction, has already proved its merit in boats of smaller size than the "Titania." That it will prove equally successful in the large machine there is no reason to doubt. The "Titania" is equipped with four Rolls-Royce "Condor" engines driving tractor and pusher screws. The weight of the machine is in the neighbourhood of 15 tons, and the wing span is about 140 ft. so that the machine is certainly not a small one. One effect of the large size is to increase the fuel capacity, which, as a matter of fact, is sufficient for a cruise of 1,500 miles. The size of the hull is such that good seaworthiness may be expected, and consequently the boat should be able to remain afloat for considerable periods at a stretch, taking on board fuel while "sitting" on the sea. It should thus be able to accompany the fleet for weeks, taking its fuel from one of the ships and riding on the sea when not working. It should even be possible to make minor engine repairs without going into dock, at any rate on more or less sheltered waters. If the new machine proves a success, which there is at present no reason to doubt, it or similar types should be able to do a good deal of the work which has hitherto been thought the province of airships. The main drawback to seaplanes has hitherto been their relatively short radius of action, but with a range of 1,500 miles, the machine becomes useful for long-distance sea patrol. If we had had a number of these boats in commission during the war, the air patrol of the North Sea would have been a different affair.

The wings are of orthodox design, that is to say of orthodox Fairey design, incorporating the Fairey Patent camber gear, in which the entire trailing edge is pulled down, thus forming a deeply cambered section giving high lift and low landing speed even with heavy wing loading. The ailerons move with the rest of the trailing edge, but retain their differential action.



#### Committee on Civil Aviation

THE Air Ministry announces that the Secretary of State for Air, when introducing the Air Estimates in the House of Commons on March 1, stated that he intended to set up forthwith a committee to make proposals for immediate action in regard to the assistance necessary for the maintenance of air transport on the cross-Channel service.

Mr. Churchill has appointed Lord Londonderry (Chairman), Sir Frederick Sykes and Sir James Stevenson as members of this committee. Several meetings have already been held with leading members of the industry.

Lord Londonderry proposes to summon a Special Conference at the Air Ministry on Thursday, 10th instant, between the members of the Committee and all parties interested, when an opportunity will be given for the views of the latter to be heard.

The armament of the "Titania" will, in addition to a useful "nest" of bombs, consist of a number of machine guns, so as to reduce to vanishing point the "blind spot" of the machine. Some of the machine guns will be placed in various positions on the wings, so that an attacking aeroplane will find some difficulty in getting to close quarters with the "Titania." The crew will consist of about seven, so that a fair number will be available for manning the guns, and the old German stunt of attacking in great numbers would probably prove of little avail with machine gunners distributed all over the boat and wings. The "Titania" is now being finally erected and the trial flights will, it is hoped, take place within the next month or six weeks.

#### The Vickers-Saunders "Valentia"

##### Two 600 h.p. Rolls-Royce "Condor" Engines

The "Valentia" flying boat, now completed at the Cowes works of Messrs. S. E. Saunders, Ltd., is partly of Vickers and partly of Saunders design. That is to say, the superstructure, wings, etc., were designed by the designing staff of Messrs. Vickers, Ltd., while the boat hull was designed by Saunders. This applies not only to the lines of the hull but also to the constructional design. As is to be expected, "Consuta" sewn ply-wood is used throughout the hull, even to the wing roots, and this material, which has already proved so successful in the Vickers "Viking" amphibian machines, looks extraordinarily well on the "Valentia." For the benefit of those who are not acquainted with the "Consuta" method of construction it may be mentioned that, briefly speaking, this consists of cementing together several thicknesses of wood, with the grains of one layer at angles to the other as in ordinary ply-wood. The resultant sheet of ply-wood is then sewn on a special machine, the seams running parallel to one another and at an angle with the grain of the wood. Thus one does not have to rely upon the glue only to hold the layers together, but has the extra strength of the stitching as well. Exhaustive tests have shown that the "Consuta" construction is extraordinarily strong for its weight, and there is little doubt that it will be employed to a very great extent in the future. Its uses are practically limitless, not only for the covering of bottom, sides and deck of flying boat hulls, but also for *monocoque fuselage* construction, as for instance in the Vickers Vimy-Commercial. It has also been used for wing covering in the Saunders "Kittiwake," where it was designed to take part of the wing stresses. Numerous other uses could be suggested, but sufficient has been said to indicate the scope for this material.

As regards the "Valentia," she is a twin-engined flying boat biplane, with the engines mounted in a pair of vees between the planes and driving tractor airscrews. The span of the upper plane, which has a considerable overhang, is 112 ft., and the overall length is about 58 ft., while the height is 22 ft. A model of this machine was, it may be remembered, exhibited on the Vickers stand at the last Olympia Aero Show. Sufficient petrol is carried for a flight of 8 hours' duration at a cruising speed of about 100 m.p.h., so that the range is about 800 miles.

The hull is of the vee bottom type, with flat "tumble-home" sides, not unlike that of the famous "Viking" in general lines, although differing somewhat from it in details. Two more machines of the same type are under construction, and the first of the three machines will probably have been completed and flown by the time these lines are in print. We understand that Capt. Cockerell, the famous Vickers pilot, who has been making alighting tests with the "Viking" on the Thames, will test the "Valentias."



#### London-Paris-Brussels Air-Mail

LAST week, following the air estimates' Civil aviation debacle, the Postmaster-General announced that temporary arrangements have been made for the continuance of the air mail services from London to Paris and to Brussels. The latest times of posting for these services (at the General Post Office 10.40 a.m. for unregistered and 10.35 a.m. for registered packets) and the amount of the air mail fee (2d. per ounce in addition to ordinary foreign postage) remain unchanged pending further notice.

Now the London-Continental service is *entirely* in the hands of foreigners, we may expect to see at quite an early date the whole of our British mails being turned over to the air-route. It was ever thus. Although maybe this will not occur until the full contract can be handed over to some German-run company.

## NOTICES TO AIRMEN

### Belgium: Additional Aerodromes and Customs Facilities

NOTICE to Airmen No. 139 of December 18, 1920, is amplified and amended as follows:—

#### Customs.

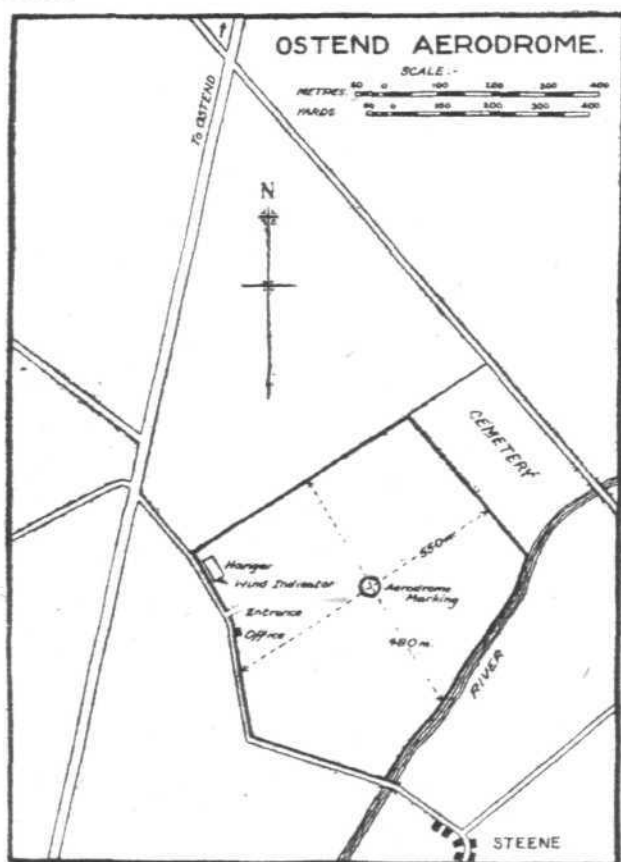
1. The second paragraph of Section 1 should now read:—  
"The only Customs aerodromes in Belgium at present are *Haren* and *Ostend*, at one of which aerodromes all aeroplanes arriving in or departing from Belgium must undergo Customs examination and clearance."

#### Civil Customs Aerodrome.

2. The following information has been received regarding Ostend aerodrome:—

##### OSTEND.—Civil and Customs Aerodrome.

*Position.*—Latitude  $51^{\circ} 12' N.$ , Longitude  $2^{\circ} 55' E.$  Situated  $2\frac{1}{2}$  kiloms. to the south of the centre of Ostend on the East side of the Ostend-Thourout road (Chaussée de Thourout) and adjoining the north-west edge of the Village of Steene.



*Description.*—Level turf surface. Dimensions for landing 550 by 480 metres. Situated at a height of 13 ft. above sea level. The surrounding country is flat, fields being frequently bordered by ditches or small canals.

*Markings, etc.*—One wind sleeve on the hangar. One white circle 24 metres in diameter in the centre of the aerodrome.

*Night Landing Facilities.*—None. There is a coastal light at Ostend Harbour, situated  $3\frac{1}{2}$  kiloms. N.N.E. of the aerodrome. Latitude  $51^{\circ} 14' N.$ , Longitude  $2^{\circ} 56' E.$  This light is a fixed white light 92 ft. above high water, visible for five miles from  $56^{\circ}$  through east to  $230^{\circ}$  (true bearings from aircraft).

*Accommodation, etc.*—One Bessonneau hangar with 20 metres door space. One metal hangar with a 66 metre door space with three 22 metre bays will shortly be erected.

Petrol, oil and water are available.

There are no facilities for repairs.

A plan of the aerodrome is attached.

#### Private Civil Aerodrome.

3. The following information is available regarding Gosselies aerodrome:—

*Gosselies.*—Private civil aerodrome established by the "Enterprises générales d'Aéronautique" of 13-15, Rue Léon Bernu, Charleroi, and available for general (but not Customs) use.

*Position.*—Latitude  $50^{\circ} 28' N.$ , Longitude  $4^{\circ} 26' E.$  Situated  $1\frac{1}{2}$  kiloms. South of Gosselies railway station and 5 kiloms. North of the Charleroi railway station.

*Description.*—Hard turf surface. Dimensions for landing, 300 by 250 metres (approx.). Situated at a height of 600 ft. (approx.) above sea level. The surrounding country is cultivated and rather undulating, especially to the South, with large groups of buildings and factories to the South.

*Note.*—Landings should, whenever possible, be made parallel to the buildings and hangars.

*Obstructions.*—West side: Hangars and buildings.

*Markings, etc.*—A wind sleeve is situated on one of the hangars on the West side of the aerodrome. A large white circle is marked on the aerodrome. The offices are painted white.

*Night Landing facilities.*—None.

*Accommodation, etc.*—Hangars, petrol, oil, water and facilities for minor repairs are available.

#### Use of Military Aerodromes by Civilian Aircraft.

4. (a) The Belgian Convention (Supplement to Art. 7) of February 26, 1920, provides that:—

(i) Civil machines may only land at military aerodromes in Belgium (except Haren) in cases of emergency or with the previous sanction of the Minister of National Defence.

(ii) In cases where repairs are necessary, only such repairs as are usually carried out by the squadron occupying the aerodrome may be made, without dismantling the machine.

(b) The following information has been received regarding military aerodromes:—

##### SCHAFFEN (DIEST).—Military Aerodrome.

*Position.*—Latitude  $51^{\circ} 0' N.$ , Longitude  $5^{\circ} 4' E.$  Situated 2 kiloms. N.N.E. of Diest on the west side of the Diest-Tessenderloo road, approximately  $\frac{1}{2}$  kilom. N.N.W. of the railway station of Schaffen village.

*Description.*—Grass surface. Dimensions for landing 650 by 600 metres. Situated at a height of 145 ft. above sea level. The surrounding country is cultivated and of a hilly nature, consisting of woods and marshy fields.

*Obstructions.*—East side:—Hangars and main road. South side:—Military buildings. West side:—A rounded hill 15 metres high and woods.

*Markings, etc.*—There is a wind sleeve on a hangar in the S.E. corner of the aerodrome.

*Accommodation, etc.*—Hangars, petrol, oil, water and facilities for minor repairs are available.

##### ASCH.—Military Aerodrome.

*Position.*—Latitude  $51^{\circ} 0' N.$ , Longitude  $5^{\circ} 34' E.$  Situated 2 kiloms. S.W. of Asch in the fork of the roads Hasselt-Genck-Asch and Bilsen-Asch.

*Description.*—Dry and fairly hard surface of turf and fine sand. Dimensions for landing, 1,100 by 800 metres. Situated at a height of 260 ft. above sea level. The surrounding country consists of well-wooded and cultivated heath land with fir tress predominating.

*Obstructions.*—North side:—Military buildings and railway. East side:—Hangars, buildings and fir trees. South-East side:—Railway and small fir trees. South-West side:—Small fir trees.

*Markings.*—There is a wind sleeve on a hangar in the N.E. corner of the aerodrome.

*Accommodation, etc.*—Hangars, petrol, oil, water and facilities for minor repairs are available.

#### Authority.

5. "Bulletin Belge de la Navigation Aérienne," No. 1 of December, 1920.  
(No. 23 of 1921.)

### Kovno to Koenigsberg by Air

ACCORDING to report from Kovno, aeroplane communication is shortly to be established between that city and Koenigsberg, the capital of East Prussia. Experimental flights on the new route will begin in a few days. A regular flying service is to be maintained during the great fair at

Koenigsberg, which opens on March 10. The service will be carried on by means of Fokker machines, with an enclosed saloon to accommodate six passengers.

The trip between Kovno and Koenigsberg will, it is estimated, take one and a-half hours. The fare will be 300 marks.



## THE AUSTRALIAN PIONEERS AT THE CECIL

LAST Thursday an important gathering took place at the Cecil Hotel, at the invitation of Messrs. Vickers, Ltd., Messrs. Rolls-Royce, Ltd., Messrs. Shell-Mex, Ltd., and Messrs. C. C. Wakefield and Co., Ltd., to welcome Sir Ross and Sir Keith Smith back to England after their historic flight from England to Australia, in the success of which each of these four great business concerns shared.

Mr. Douglas Vickers, M.P., presided, and Sir Frederick H. Sykes, Controller-General of Civil Aviation, attended to present the Air Force Crosses to Capt. Stanley Cockerell and Capt. F. Crossley Broome, and Air Force Medals to Mr. C. Corby and Sergt.-Maj. J. Wyatt, which were awarded in connection with the South African flight. In addition it fell to Sir Frederick Sykes to hand to Sir Ross Smith and Sir Keith Smith handsome presents from Messrs. Rolls-Royce, C. C. Wakefield and Shell-Mex.

The Chairman, proposing the health of the guests, after detailing the enormous difficulties encountered by the two pioneers and their mechanics in their epoch-making journey to Australia, said that Sir Ross and Sir Keith Smith, with inadequate machines (for, after all, the Vickers-Vimy they used had been originally designed for war purposes) had proved for all time that inter-communication by air between all parts of the Empire was practicable. Their journey was of far more significance than voyages to the North and South Pole. Some time or other, when the nation began to take a little more interest in aviation, they would see the effect of that trip in a properly organised postal service between England and Australia.

These gentlemen had now undertaken further missionary work to further the good cause by showing the public through their lectures and photographs, that there was a real use for the Empire of aviation besides mere military requirements, and he hoped they would incidentally glean much profit, in addition to satisfaction, for their admirable scheme of lectures.

Lord Herbert Scott supported the toast, and said he felt honoured in being able to be joint hosts to honour their guests, as the Rolls-Royce Co. had the privilege of supplying the engine to the machine built by Messrs Vickers, Ltd., who were the generous promoters of the great adventure. That engine was not a special engine, but an ordinary war engine. Had there been time they would have been willing to design and instal an engine suited to the job. It was therefore specially plucky for Sir Ross and his brother to undertake the flight under the conditions. Lord Herbert then emphasised the wonderful work of the two mechanics who accompanied the pilots and quoted some incidents in illustration of their wonderful resourcefulness. It was due to them, he said, and they should have them in their mind when they drank the health of their guests that day, in honour of the enormous amount of devilling which they had to endure to bring the flight to a successful issue. It was, he said, sad to think that in 1921 the country was full of apathy with regard to flying. He wished that his own old branch of the service had not again been put in scarlet and gold, and that some of the money could have been devoted to aviation.

Sir Ross Smith thanked their hosts for their reception. But in their honours he thought it was right to include Messrs. Vickers, Ltd., who had made it possible with their machine to accomplish the flight. They had only about three weeks

to arrange matters. There was also Mr. Cates of the Shell-Mex Company, who undertook to see that their fuel should be in readiness for them throughout the route, and although he doubted it being possible to arrange this, they found that in every instance that their fuel was waiting for them, even at the smallest place. As to the Rolls-Royce engines, he could not speak highly enough of them. He must thank Mr. Royce for their perfection. At times, when they went through their worst experiences, the only happy things were these engines. They never failed them once. He looked forward to an early establishment of regular services. He looked forward to the time, and he was sure that it would come very soon, when they would have a machine flying from this country to Australia once a week, and not only to Australia but to every other part of our dominions.

Sir Keith Smith, who also responded, reiterated the thanks of his brother. He would say, however, that they owed a large measure of thanks to the officials of the Air Ministry, who gave every assistance to them throughout their flight at the various aerodromes. Sir Keith then gave some instances of their weird experiences which, except for the native assistance, they would never have got through, even by now. Amongst the incidents he mentioned, was one of a landing in a pond in Siam. The authorities immediately came to their assistance with 200 convicts from a local prison, all of them adorned with leg-chains and most of them reputed murderers. But they worked with such good will preparing a path that the machine was enabled to proceed the following day. It was not a case of two officers and two sergeants on that trip, he said. It was purely team work. They were simply four Australians co-operating together. In illustration of this he narrated how, when making a landing on Singapore racecourse, there was some danger of over-shooting, owing to the nature of the approach, over hills, and the circumscribed area of the racecourse. On touching land he looked round to see how things were going, and found that Sergeant Bennett, while in mid-air, had climbed on to the tail of the machine to ensure that the skid came into play in time to prevent disaster.

Sir Robert Waley Cohen, K.B.E., of the Shell-Mex Company, who proposed the toast of Imperial Air Routes, said that in spite of the present breakdown of British civil aviation, he was convinced that the Imperial air routes were going to be a great progressive factor in consolidating our Empire. He thought the present position was merely an episode, and would soon pass. Civil aviation would soon redeem itself, and would go forward and become a great industry in the near future. He very much doubted if there were any other new industry which could have gone forward under present conditions. Even those industries which had a solid and old foundation had the greatest difficulty in carrying on. No industry, he considered, should be dependent on Government control, but aviation at such a time as this possibly needed temporary assistance; but that would be only a passing phase, and in the end he was confident of the permanent success of the great science.

Sir Charles Wakefield, who supported the toast, opened with a few humorous references, and said that their guests' wonderful feat had put the most exuberant invention of a Jules Verne into the shade.

"There is one aspect of their achievement which to my



A group of articles presented to Sir Ross Smith, Sir Keith Smith and the mechanics. The model of the Vickers-Vimy machine and the clock were for Sir Ross and Sir Keith respectively, from Messrs. Shell-Mex, Ltd.; the wrist-watches were from Messrs. Vickers, Ltd.; the two other watches—from Messrs. C. C. Wakefield—the two gold cigarette cases and the two silver cases—from Messrs. Rolls-Royce, Ltd.—were for Sir Ross and Sir Keith Smith and their two mechanics respectively.

mind gives compelling evidence as to the ability, resource and physical endurance of these young men. Those who have had practical experience of flying know what is involved in a non-stop flight from London to the centre of France—and on a very cold day. Do we realise that between London and Port Darwin, Sir Ross Smith and his companions made twenty-two great flights? They flew straight ahead, over every kind of country and through every kind of weather. The conditions at times must have been discouraging in the extreme, but they were flying to their home and to their parents, and they knew that the eyes of the world were on them and the reputation of British aviation was in their hands. I think their great series of twenty-two consecutive flights is an exhibition of the finest possible skill, courage and perseverance. Speaking on behalf of my firm, may I say how proud we are to have been associated with the organisation of the flight and to have done our share towards the perfect running of the Rolls-Royce motors which carried the Vickers Vimy to the other side of the globe? I am sure we all look forward to the pleasure of hearing Sir Ross Smith's lecture, and to seeing the unique pictures of the flight. In this great adventure, Sir Ross Smith and Sir Keith Smith laid the foundation stone of our Imperial Air Routes, and, although British Aviation is passing through critical times, we have faith that their gallantry will bear fruit. We believe that the Government cannot and will not let British lag behind for lack of the right kind of support given at the right moment. We are confident that our other distinguished guest, Maj.-Gen. Sir Frederick Sykes—of whom all those interested in British Aviation are expecting great things—realises the importance of assisting in the establishment and development of Imperial Air Routes. We must at all costs secure for the Empire the benefit of the splendid pioneer accomplishment of the historic flight to Australia."

Maj.-Gen. Sir F. Sykes, in whose hands was the reply, said that the Imperial Air Route was one of the finest developments of this old Empire of ours. He was very proud to have tried for two years to carry forward into civilian aviation results of the splendid efforts made during the War. When he started the department, without organisation, practically by himself, he found an absolute unanimity within the industry and outside, in the Press and among the Governments of the Dominions that these Empire routes should be formed. Their chairman was the head of a firm that had evolved a machine which had rendered possible each of the three great pioneer efforts—Alcock's magnificent dash across the Atlantic, the wonderful journey sustained from day to day from England to Australia, and the African flight, which again had its own peculiar obstacles and called for particular qualities. The results of those journeys were of tremendous importance to aviation as a whole. Aviation was a difficult

game and one in which conventionality had to be cast aside, and we had to think elastically and with imagination. If we could only induce the outside world to realise this all would be well. One of the great difficulties of air transport was to put it on a real economic basis. They had got to get a machine which was capable of carrying out that transport; but they were not very far from that. It would be a great pity if through a lack of continuity they did not get an ideal machine. They must carry on the continuity between war and peace machines, and if that meant that they must get Government backing and support they must get it. After the experience they had gained, he did not think they were going to drop carrying through that continuity. They had made a "nearly-paying" proposition by means of war machines modified for peace purposes. They could surely make a paying proposition with machines designed entirely for commercial uses.

Sir Frederick then presented Air Force Crosses to Captains Cockerell and Broome, and Air Force Medals to their mechanics, Messrs. Corley and Wyatt, for their South African flight. He also presented gifts to Sir Ross Smith and Sir Keith Smith and their mechanics from Vickers, Limited, Rolls-Royce, Limited, Shell-Mex, Limited, and C.C. Wakefield, Limited.

Amongst others present were Mr. J. R. Collins, High Commissioner of Australia; the Hon. Sir T. A. Coghlan, K.C.M.G., Agent-General of New South Wales; the Hon. Sir E. Lucas, Agent-General of South Australia; the Hon. A. H. Ashbolt, Agent-General of Tasmania; the Hon. Sir P. McBride, Agent-General of Victoria; Sir Edward Brockman, K.C.M.G., Malay States Agency; Lieut.-Gen. Sir A. S. Cobbe, V.C., Military Secretary, India Office; Commandant Sablo, French Air Attaché; Lord Montagu of Beaulieu; Sir William Joynson-Hicks, M.P.; Major Melvin Hall, D.S.O., American Air Attaché; Air-Commodore E. M. Maitland; Brig.-Gen. R. K. Bagnall-Wild; Maj.-Gen. E. D. Swinton; Brig.-Gen. Sir Capel Holden; Messrs. P. Chalmers-Mitchell, H. White-Smith, Claude Johnson, Capt. Stanley Cockerell, A.F.C.; Capt. F. Crossley Broome, D.F.C., A.F.C.; Lieut.-Col. W. Lockwood Marsh; Col. P. Buckley, Australia House; Commander H. Perrin; Col. Alec. Ogilvie, O.B.E.; Sergt.-Major J. Wyatt; Major W. A. Coates, Australian Liaison Officer, A.M.; Lieut.-Col. The Master of Sempill; Col. W. A. Bristowe; Capt. Aston; Capt. H. Gillman; Wing-Commander W. D. Beatty, C.B.E., A.F.C., A.M.; Messrs. Charles V. Allen; Stanley Spooner; Fairfax Scott, M.A.; Frank Fisher, Douglas Thorburn, R. P. Wilson, F. L. Halford, R. P. Walker, B. E. Fenwick, A. F. Gammond, R. K. Pierson, M.B.E.; Maxwell Muller, O.B.E., and Howard Corbett.

## SIR ROSS SMITH AT THE PHILHARMONIC HALL

### A Charming Travelogue

CAPT. SIR ROSS SMITH, who, with his brother, Sir Keith Smith, and the two mechanics, Sergt. Shiers and Sergt. Bennett, flew from London to Port Darwin, Australia, in 28 days (left London November 12, arrived Port Darwin December 10, 1919), told the story of their flight to an interested audience at the Philharmonic Hall on March 7. Sir Ross told his fascinating story in a most charming, unassuming and witty manner, and so far from claiming any of the credit for himself, ascribed the success of the trip to the excellence of the Vickers-Vimy machine, the Rolls-Royce "Eagle" engines, the motherly care taken of them by his two mechanics, and the good navigation of his brother, Sir Keith Smith. At no time, said Sir Ross, were they more than half a mile off their course, and in view of the nature of the journey this must certainly be admitted to be a most excellent piece of aerial navigation.

Sir Ross paid a warm tribute to his French competitor Poulet, who, on a small twin-engined (le Rhone) Caudron, managed to get as far as Bangkok. It was not, he said, until he saw how small the Caudron looked next to the Vimy that he realised the magnitude of Poulet's achievement. Had the Frenchman been flying as powerful a machine he would probably have beaten them.

The narrative was illustrated by a series of exceedingly interesting films and lantern slides, the latter coloured, and some of them three-colour photographs of unusual quality, taken by Sir Keith Smith. We venture to prophesy that the Philharmonic Hall will be packed every night as long as Sir Ross Smith continues his Travelogue there, and would impress upon every one interested in aviation from any point of view whatever not to miss the exceptionally interesting account of the most marvellous flight ever made.

### The Caproni "Nineplandem" Flies

FROM Milan it is reported that the huge Caproni triplane, which has been nicknamed the "Nineplandem" from the fact that it has three triplane sets of wings arranged one behind the other, made its first trial flight on March 2. The machine is stated to have got off well and to have risen to a height of 20 ft. This indicates that no attempt was made to fly the machine, the tests being merely to test the "planing" capacity to see if it were possible to "unstick." In addition to the pilots and mechanics the machine is stated to have

carried about one-and-a-half ton of ballast to represent some of the 100 passengers which the machine is designed to carry.

### And Comes to Grief

ON March 4 it was announced from Milan that the Caproni "Nineplandem" made a second test flight, but that in descending something went wrong and the machine made a bad alighting on the water. The pilot and mechanics were uninjured, but the machine is said to be pretty badly damaged.



# CAMBRIDGE UNIVERSITY AERONAUTICAL SOCIETY

(OFFICIAL ORGAN "FLIGHT")

IN our issue of February 17, 1921, mention was made of a paper read on January 26 by Air-Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C., entitled

## "Some Problems in Aeronautical Research,"

the manuscript of which was not available at the time. We have now secured a copy of the paper from the Air-Commodore, and the following are some extracts from it:—

In his introduction, Air-Commodore Brooke-Popham referred to the importance of aeronautical research, and mentioned that aeronautics covers a vast field and is directly or indirectly connected with nearly every other branch of science and engineering. If aeronautics is going to advance along sound lines, the country must be prepared to spend money and to realise the necessity for long and laborious research. It is no good waiting until the results are wanted before beginning experiments. If one wants improvements in five years' time, one must start now. During the War, application got ahead of research, mainly because time was of vital importance, while the question of cost was of little consequence. This does not apply to the present day. The horizon is boundless, there is no limit. What we must do is to lay the foundations first and then build steadily upwards, making each step definitely sure before we proceed to the next one.

The lecturer then mentioned the cost of research, and called attention to the fact that all research is expensive, and especially aeronautical research. By way of an example he mentioned that some time ago he started a design for a test house for testing aero-engines under conditions corresponding to altitudes of up to 30,000 ft. The original lay-out was to allow for any engine we would be likely to have in the next five years. The estimate, however, reached a figure of £100,000, and so he had to stop and be content with something on a much more modest scale. Even a 7-ft. wind channel costs over £20,000 to build, and absorbs 200 h.p. all the time it is running.

As regards future fields for research, the Air-Commodore mentioned first of all the engine. Although aeroplane engines have reached a very high degree of efficiency, they are such an essential part of flying that we must aim at perfection and not be content with anything less than that. The lecturer then referred to the question so often raised by uninformed persons as to why we cannot produce an aeroplane engine which is as reliable as that of a motor-car. He pointed out that the conditions under which the two work are entirely different, and finally challenged the opinion that the aeroplane engine is less reliable, pointing out that if one were to keep an accurate record it would be found that the aero-engine does not compare unfavourably with the car-engine. All that happens in a car is that if one's engine is not pulling well one drops down to a lower gear when going up a hill. If an aero-engine is not pulling well when taking off, a crash is very likely. Therefore, we must have a higher degree of perfection in an aero-engine than is necessary or permissible in a car-engine.

Turning now to the cause of engine failure, the lecturer pointed out that an analysis showed that 80 per cent. of these can be traced to failure of the "engine accessories," and it is consequently to these chiefly that we must devote attention. For instance, there is the petrol system. Most of these are unnecessarily complicated, and we want a simplified method of petrol feed. Thus we still require a really satisfactory petrol-proof flexible tubing. Another item that is needed is a reliable petrol gauge. As regards the ignition system, also a source of trouble, the only really satisfactory way of getting over all the difficulties is to do away with it altogether, and to use some modification such as the Diesel principle. On the question of engine starters, the lecturer pointed out that we have satisfactory starters for use on the ground, but so far no really satisfactory engine starter for use on board exists.

The Air-Commodore then mentioned the advantages of flying high, if the engine power can be maintained, and referred to the various methods of maintaining the power, such as forced induction, etc., and called attention to the

suggestion made by Mr. Ricardo in his paper before the R.Ae.S. recently (published in *FLIGHT* of December 30, 1920.—ED.) of admitting a quantity of cooled exhaust gas on each induction stroke. He also pointed out that to derive full advantage of maintaining the power of an engine one must have a variable pitch airscrew.

As regards the question of fuel, the lecturer pointed out that the value of a fuel cannot be judged entirely on its B.T.U. per lb., mentioning alcohol as a case in point. In an aero-engine the practical thermal efficiency with petrol is approximately 25 per cent. with alcohol it would be increased to 35 per cent. In fact the thermodynamic value of the two per unit of weight is in the proportion of 7 of alcohol to 10 of petrol, whereas the power obtainable per unit of weight is in the proportion of 9 of alcohol and 10 of petrol. The lecturer pointed out that he mentioned this as an instance only, and did not recommend alcohol as a fuel for aircraft engines, owing to certain disadvantages which alcohol possesses. On the question of fire, the Air-Commodore stated that in peace time the danger of a machine catching fire in the air is very small. In a crash, however, cases are on record of machines having been set on fire by metal parts striking stones and thus causing sparks.

The lecturer also referred to the possibility of using steam engines, although admitting that the weight would probably be greater than that of an internal combustion engine, while the fuel consumption would probably also be higher. One of the advantages of steam is that the power does not drop off with altitude, and for short periods, such as getting off, it is possible to get an increase of power. He then mentioned the attractiveness and simplicity of jet propulsion.

The importance of low fuel consumption was also dealt with, and the lecturer gave the following illustration: "For instance, if we save  $\frac{1}{10}$  lb. per b.h.p. per hour and the journey takes 6 hours and the engine develops an average of 300 h.p. throughout the flight, there will be a total saving of 180 lbs. of petrol. This might cost, say, 4 guineas, but the freight space of 180 lbs. will be worth some £25.

As regards improvement in aircraft themselves, the lecturer stated that there had been practically no progress at all from an aerodynamic point of view. All that was done to get performance during the War was to increase the power and pull the machine along by brute force. This was not the fault of the designers at all. We had to have the machines quickly, and this was the only way of getting them. We ought, however, to recognise the fact and see what improvements can now be made to the aeroplane itself. For instance, the undercarriage offers a lot of resistance, and if it can be tucked inside the body during flight the speed is increased. Designers in this and other countries are now tending towards very thick wing sections; so deep that the engine, petrol tanks and, possibly, even the passengers can be accommodated inside the wings. The Air-Commodore said he thought we had not got to finality in wing form yet, and said he would like to see photographs of the actual eddies formed around a wing in flight. Again, as regards the arrangement of the component parts. The lecturer said he was not at all certain that we had exhausted all possibilities of the disposition of wing, engine, etc., either from the point of view of convenience and visibility or from the point of view of aerodynamic efficiency.

As regards the difficulty of navigation in foggy weather, we now have instruments which enable pilots to fly in fog or cloud, but the difficulty is landing, and an instrument is badly wanted which will indicate the actual height above the ground. It is also important to have stable machines which require steering only for the greater part of a flight. The lecturer referred to the amphibian type of machine, and pointed out the advantages such a machine possesses. He also mentioned the need for developing the ship's 'plane.

A brief reference was made to airships, and the point of "false lift" was dealt with, and the lecturer concluded with a reference to the military side of aviation, pointing out that we may some day have a very rude awakening if we take the limited results obtained during the last War as a criterion of what will happen in the next.

## German Aeroplanes and the Treaty Terms

INFORMATION was forthcoming in Parliament, last week, as to the latest figures relating to the surrender of aeroplanes by the Germans under their Treaty obligations.

The number of aeroplanes and seaplanes surrendered to

the Inter-Allied Military Commission of Control since the Armistice is 15,368.

It was also announced that no military machines have been constructed during the period of surrender, but 59 aeroplanes designed for civil purposes have been manufactured.

# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## ANNUAL GENERAL MEETING

THE Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Wednesday, March 30, 1921, at 3, Clifford Street, New Bond Street, London, W.1, at 6 p.m.

### Committee

In accordance with the Rules, the Committee shall consist of 18 Members. Members are elected to serve for two years, half the Committee retiring annually.

Retiring Members are eligible for re-election.

The retiring Members of the Committee are:—

Lieut.-Col. John D. Dunville.  
Lieut.-Col. Spenser D. A. Grey, D.S.O.  
Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.  
Squadron-Leader T. O'B. Hubbard, M.C., R.A.F.  
Lieut.-Col. F. K. McClean.  
Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F.  
The Viscount Northcliffe.  
Lieut.-Col. Alec Ogilvie.  
F. Handley Page.

Squadron-Leader T. O'B. Hubbard, M.C., R.A.F., and Lieut.-Col. Spenser D. A. Grey, D.S.O., will be going abroad shortly, and do not offer themselves for re-election.

Any two Members of the Club can nominate a Member to serve on the Committee, provided the consent of the Member has been previously obtained. The name of the Member thus nominated, with the name of his proposer and seconder, must be sent in writing to the Secretary not less than fourteen days before the Annual General Meeting.

### International Seaplane Race

The Royal Aero Club has decided to contribute £1,000 towards the expenses of the British representatives competing in the International Seaplane Competition for the Jacques Schneider Trophy, to be held in Venice in September.

Italy is the present holder and each Country is entitled to challenge with three competitors. The Royal Aero Club will select the three competitors to represent Great Britain, and all enquiries should be addressed to the Secretary.

Offices: THE ROYAL AERO CLUB,

3, CLIFFORD STREET, LONDON, W.1.

H. E. PERRIN, Secretary.

## KEEN CONTESTS FOR WAKEFIELD BOXING TROPHIES

HALTON CAMP, Wendover, was last week the scene of the annual contest for the Boxing trophies presented by Sir Charles Wakefield. Competition was keener than ever and that the contest is looked forward to with considerable consideration is very apparent from the all-round improvement in style exhibited at this year's event. Some really smart bouts were seen in the Team Championship, and the entries were so numerous and the boxing so good that it was necessary to keep going on Wednesday, the first day, until midnight, to prepare for the semi-finalists on Thursday morning. A start was then made at 9 a.m. in order that the finalists might get a breathing stretch before taking the ring again. Two points were throughout noticeably good: the boxing of the novices and the remarkably fine condition of the entrants, almost without exception; moreover, there was no playing at it. Convincing blows were given and taken freely with the very best temper and after some of the many "professional" exhibitions which have been such a feature of the landscape, the absence of holding on, wrestling and similar tactics was a very striking contrast for those who go to see and like to see boxers box. The Wakefield Trophies look as if they were bringing out all that is best in the young and promising aspirants for honour, in which the R.A.F. seem to be so very wealthy. Throughout, the proceedings ran without a hitch, without question due to the admirable organisation of the tournament, in the hands of Flight Officer Smith, the lightweight champion of the R.A.F., assisted by Flight Officer F. W. Sherriff, M.C., the light-heavyweight champion, the latter also being responsible for the Hon. Secretaryship of the Association.

Both trophies were won by Halton Camp, the officers scoring 17 points to 12 by Henlow, and the other ranks scoring 51½ points, which was more than double that of Uxbridge, who were second.

In the officers' competitions, the entries were not over heavy, although quality was in strong evidence in the absence of quantity. The results were as follows:—

### Officers.

**Lightweight.**—Flight-Officer Wynne Eyton (No. 1 Group) beat Flight-Officer Sandeford (Henlow) on points.

**Featherweight.**—Flight-Officer Havard (No. 7 Group) beat Flight-Officer Horsely (No. 1 Group) on points.

**Bantamweight.**—Flight-Officer Polden (Henlow) beat Flight-Officer Trevethan (No. 10 Group) on points.

**Middleweight.**—Flight-Officer Page (Halton) beat Flight-Lieut. Stevenson Peach (Henlow), the referee stopping the fight in the third round.

**Welterweight.**—Flight-Officer Garraty (Halton) beat Flight-Officer Trail (No. 1 Group) on points.

**Light Heavyweight.**—Flight-Officer Birkbeck (Halton) beat Flight-Lieut. Candy (Henlow) on points.

**Heavyweight.**—Flight-Officer Hart (Henlow) beat Sqdn.-Ldr. Miles (No. 7 Group) on points.

### Other Ranks.

**Featherweights.**—Second series: A. C. Boteler (Halton) beat A. C. Wells (Uxbridge) on points; A. C. Gilbrook (Cranwell) beat A. C. Ramney (29 group), who retired in the second round; A. C. Barnes (Henlow) beat A. C. Hensta (1 group) on points after an extra round; A. C. Angelo (Isle of Grain) beat A. C. Richardson (7 group) in one round. Semifinals: Boteler knocked out Gilbrook in the second round; Angelo beat Barnes in the first round. Moteler beat Angelo, the referee stopping the contest in the first round.

**Middleweights.**—Second series: A. C. Hedge (3 group) beat A. C. James (1 group) on points; A. C. Bragg (29 group) beat Sgt. Coleman (Cranwell) on points; A. C. Fletcher (Isle of Grain) knocked out A. C. Fairley (Uxbridge) in the first round; A. C. Pogne (Henlow) beat A. C. Hayter (10 group) on points. Semi-finals: Hedge beat Bragg in one round; Fletcher knocked out Pogne in half a round. Fletcher beat Hedge, who retired in the first round.

**Heavyweights.**—Semi-finals: L.-Cpl. Cracknell (Halton) beat A. C. Hailes (7 group), who retired in the first round; A. C. Eldridge (Howden) knocked out A. C. Stanley (Uxbridge) in 20 secs. Final: Cracknell beat Eldridge, who retired during an extra round.

**Bantamweights.**—Second series: A. C. McLachlan (29 group) beat A. C. Frieth (Isle of Grain), who retired in the first round; A. C. Smith-Pain (Henlow) beat A. C. Sutherland (3 group), who retired in the second round; A. C. Boland (Halton), a bye. Semi-finals: A. C. McLachlan beat A. C. Germain (7 group) who retired in the third round. Boland beat Smith-Pain on points. Final: McLachlan beat Boland on points.

**Lightweights.**—Semi-finals: A. C. Canning (Halton) beat A. C. Griffiths (3 group) on points; L. A. C. Moss (Uxbridge) beat A. C. Mitchell (Howden) on points. Final: Canning beat Groves on points.

**Light Heavyweights.**—Semi-finals: A. C. Barrett (Halton) beat A. C. Picker (Howden) on points; A. C. Groves (Henlow) w.o., A. C. Kimmick (10 group) absent. Final: Barrett beat Groves on points.

**Flyweights.**—Semi-finals: A. C. Davis (1 group) beat A. C. Burns (7 group) on points; A. C. Millington (Halton) outpointed A. C. Alexander (Uxbridge). Final: Davis beat Millington, who retired in the first round with an injured hand.

**Welterweights.**—Semi-finals: A. C. Herridge (Halton) beat A. C. Brettel (Uxbridge) on points; A. C. Broadway (7 group) beat A. C. North (10 group) on points. Final: Herridge beat Broadway, disqualified in second round for hitting low.





THERE are quite possibilities in the free offer of the Government of the nation's airships, subject to certain reservations as to their future. In one or two directions there are rumours. At least one definite offer has been made "to take over" the fleet by the Brompton Motor Co., who state they are serious in their proposal. The Secretary of the Company explains that if their proposition to the Air Ministry goes any further, it is their idea to employ the airships for commercial transport and adds:—"Our proposition is quite a serious one, with capital at the back of it. Most of the persons concerned are ex-R.A.F. members, and have a thorough knowledge of aviation."

MAYBE, but it will no doubt be up to the A.M. to see they get something pretty firm as to the proposed procedure, if it only be guaranteed promises.

FOR the purpose of handling the American overseas traffic, an air service is spoken of between Cuxhaven and Berlin, under joint American and German auspices. There is a touch of humour in this, having regard to the fact that the two countries are still, nominally at war.

A SET of three particular postage stamps for use in the air post service between Spain and Morocco is about to be issued by the Spanish Post Office in a picturesque design by Don Bartholome Maura, of the Royal Mint, depicting a mail-plane flying over a sunlit bay. The stamps are of 10, 25, and 50 centimes.

AWAY in the Sacramento Valley, California, they evidently have imagination concerning the openings for utilising aeroplanes. According to a correspondent of the *Pall Mall Gazette*, a trio of sportsmen have conceived the idea of catching wild waterfowl alive, above the ricefields of this district by seining them out of the sky with nets carried through space by an aeroplane.

They needed live wild duck, geese, and brant for use as decoys when the hunting season opened, so they rigged up an aeroplane with two halibut trammel nets and proceeded to seine the wild fowl out of the skies.

Two large steel hoops were made and fitted between the wings of the aeroplane, and from these hoops two nets were strung. These nets are funnel-shaped, and in the small end of each a circular piece of canvas was placed.

When the aeroplane is on the ground the nets hang limply between the wings, but as soon as it gets into the air the rush of air through the nets and against the piece of canvas at the small end holds them straight out their full length.

The aeroplane was fitted with a heavy propeller, strong enough not to break when flying through a flock of fowl.

In three days of flying more than 500 ducks and geese were caught. From this number the sportsmen selected fifty of the kind they wanted—mallards, pintails, teal, and Canada geese. Only the young birds were retained, and the remainder liberated.

For genuine thrills and sport, the correspondent claims netting wild fowl in the air makes all other outdoor sport pale into significance. The ducks cannot outfly, but can easily out-manceuvre an aeroplane.

In consequence catching a desired bird in the nets called for some acrobatic flying. It was nothing uncommon for the birdmen to dash into a flock of retreating wild fowl, and then do a barrel roll in an effort to scrape a few more birds into the net.

Sounds exciting, anyway.

How some people see things. An unbiased view upon air-mishaps from the *Birmingham Dispatch* :—

"BIG PARACHUTE TO LIFT CABINFUL OF PASSENGERS.

"It is ninety-nine years since George Stephenson's locomotive ran on the Stockton and Darlington Railway, but train smashes are still occurring. Yet nobody boycotts railway travelling as unsafe and goes on foot in consequence.

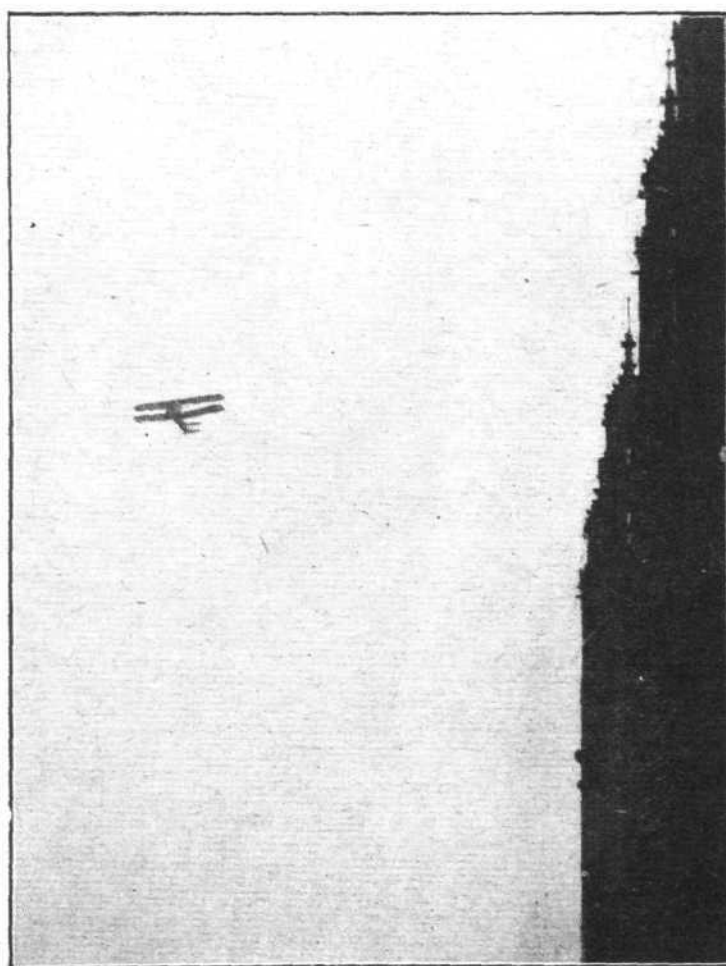
"About an aeroplane crash, however, thousands of people

wax hot and eloquent, and rave about flying being forbidden. Such folk cannot assimilate facts, or else they would realise the absurdity of talking about the risks of a new form of transit that can claim a record of only three people killed during a year's working of a service that carried 82,000 passengers and covered nearly 2,000,000 air miles—to be exact, 1,800,000 miles.

"Happily, however, such a low percentage of risks is likely to be even lower in future. There is not only the French engineer's invention now available for controlling stability of flight, but experiments are being made, said Major Orde Lees recently, for lifting a whole cabinful of passengers *en bloc* from a moving aeroplane by one great parachute."

THE statement "An aerial taxi-cab in London costs approximately the same as an earth-bound taxi in New York," of Prof. E. P. Warner of the Massachusetts Institute of Technology and the National Advisory Committee for Aeronautics, in his paper, "Commercial Aviation in Europe," read recently before the Commercial Aviation Session of the Annual Meeting of the Society of Automotive Engineers, must make our London taxi-bandits green with envy. We only hope they will not be enterprising enough to secure a copy of our home "flip" tariffs, just by way of a guide as to the fare-figure to which they may themselves hope to soar—in their imaginations.

THE information, however, is a bit discounted when the Professor goes on to state that "The charge in England for an aerial taxi is 2s. 6d. for two persons per mile, and an airplane can usually be had at an hour's notice."



A THAMES AERIAL IDYLL: The Lion-engined Vickers "Viking" passes the Houses of Parliament towers.

# AIR ESTIMATES, 1921-22

THE SECRETARY OF STATE FOR AIR, in introducing the Estimates, said: I pointed out two years ago that, quite apart from clearing away the gigantic debris and enormous mass of material which the War had left, and which had to be dispersed in one way or other, it would take, in my opinion, five years to make an efficient, self-respecting, well-disciplined, economically organised Air Force. About eighteen months of these five years have now gone, and the progress has been very much greater than I had ventured to hope. It has been rendered possible solely by the fact that during the whole period we have had continuity of administration. There has been no chopping and changing either of men or of plan so far as the Royal Air Force is concerned. Everything is being carried out step by step as was intended, every superior officer or official is pursuing his work with a sense of being accountable, not for a week or for a month, but for the year after next, and possibly the year after that. Every subordinate is doing his duty with the sense that he has got to give satisfaction to superiors and seniors who are not going to be shifted and changed with every gust of service intrigue or of newspaper agitation or anti-waste agitation. There is absolutely no other way in which you can form a disciplined force worthy of the name or worthy of this country. No more complicated service has ever been brought into existence in this world. There are few people who have any idea of the complexity of the organisation of an Air Force. There are, for instance, no less than fifty-four trades, of which thirty are highly-skilled trades, involved in the production and in the repair of an aeroplane. That gives an idea of the immense complexity from a technical point of view. Almost every known science and art practised among men is involved in aeronautical research. The Navy and Army can each specify a large number of separate and particular functions, each requiring a special type of machine each requiring a specially trained pilot, which they demand to have fulfilled for them by the Royal Air Force. It is difficult to make an officer, to train men for the responsibility and bearing which an officer requires. It is difficult to make a pilot, to secure that extraordinary facility in the conduct of the machine in the air; but in the Royal Air Force, when you have trained a man both to be an officer and to be a pilot, trained the same man to both these important functions, even then you are not by any means at the end. The pilot, with all his skill in flying, with all his knowledge of his machine, would be a mere prey to an enemy unless he could, in addition, fulfil at least one of the highly specialised functions of aerial war—gunnery, bombing, torpedoing, photography, wireless telegraphy, spotting for artillery, observing, and other functions of that kind. Our organisation must therefore provide for a large number of varied schools and training establishments, and this is what we have been steadily building up in different parts of the country, according to one scheme, in the last 18 months.

At Halton we are going to train 3,000 boys to be skilled mechanics, with an eventual output of 1,000 a year, and here and at Manston adult recruits are now undergoing an intensive course of technical training. At Cranwell we are training cadets to be officers, and simultaneously a large number of the boy mechanics who are eventually to be accommodated at Halton. At Upavon we are teaching men to be instructors in flying, and officers are also given a course of practical engineering. At Netheravon and five other training schools, one of which will be in Egypt, we are training officers to become highly skilled pilots, not instructors, but pilots. At Andover a school will be opened to teach air pilotage and night flying. Eastchurch will be a station where armament, aerial gunnery, and bombing are taught. At Gosport they will learn torpedo dropping from aircraft, and experiments are being conducted to improve the methods of observation for naval guns, and the wireless control of surface craft, that is to say, of self-propelled vessels which move without any man on them through the sea and are directed in their movements by an aeroplane in the air with wireless. At Flowerdown there is an electrical and wireless school. At Larkhill kite balloon training is undertaken. At Farnborough, photography in all its forms, that is to say, the taking of photographs, the reproduction of photographs rapidly, the understanding and reading of photographs, and the detection of the meaning of photographs taken from the air—a wonderful science in itself.

At Uxbridge is the Air Force depot, and there we have a physical training school. At Salisbury and Farnborough artillery and infantry co-operation are taught to work with the aeroplanes of these two other Forces. At Calshot, air navigation over the sea, long-range flights by the stars or by other methods, and sea-plane flying. At Felixstowe, and Leuchars, in Scotland, are stations where the co-operation of the Navy is carried on. Then there are the great experimental stations at Martlesham, Grain, and Biggan Hill. Then there is the Royal Aircraft Establishment at Farnborough, an institution most vital for the general development of flying. There is a research laboratory with schools for medical officers at Holly Hill, to enable them to study the medical problems which are peculiar to aviation. Lastly, there are courses of general instruction which we have arranged at Cambridge, Oxford, London, Capetown, and Sheffield in the great universities in these cities. These courses deal, firstly, with the theories underlying aviation, and, secondly, they provide specialised engineering instruction.

Our organisation has now been carried to a point where its entire scope can be discerned. It is still very new; it still wants the rest of the five years to complete it. The training organisation of the Royal Air Force, will, as it develops and perfects itself, become a great technical university for the nation, with the glamour and traditions of a gallant service super-added.

Upon the foundation which I have described if these training establishments are maintained the fighting squadrons upon which we are relying to keep peace and order throughout the Empire and to preserve for us the means of defence at home. There are 28 fully-formed service squadrons, of which six are in Egypt and Palestine, five in Mesopotamia, eight in India, one on the Rhine, one at Malta, the last not yet fully equipped; thus 21 out of the 28 squadrons are overseas. The equivalent of three more squadrons are in Ireland, three are working with the Navy, while one is employed at home in giving refresher courses to pilots. The four additional squadrons which are the residue of the five sanctioned by the House a few months ago, will begin forming on April 1, and that brings our total up to 32. These additional squadrons are wanted in many directions. They constitute the only reserve for all contingencies that we possess in the flying service. These fighting squadrons and training establishments comprise 2,900 officers, about 25,000 men, with a certain number of civil assistants. That is the Air Force upon which, rightly or wrongly, we have been labouring for the last two years.

In addition, we propose this year to begin the formation on a very small scale of a Territorial Air Force, for which £20,000 is taken in the Estimates. Our idea is to have six squadrons, stationed near centres where there is a large engineering population, and where aerodromes are available. Each squadron would have a small nucleus of regular air mechanics, and it is hoped that the skilled voluntary element in the neighbourhood will form this small nucleus.

Such is the organisation of the Royal Air Force.

I am very anxious to illustrate how foolish and wasteful it would be if we were to take advice which is pressed upon us from more than one quarter at present. It is said, for instance, "Is not the War over, was not the last War the war to end war?" It is also said, "What do we want all this service

aviation for? Instead of this let us go in for some splendid new development of civil aviation. Let us take seven or eight millions from the Royal Air Force and devote them to the pursuits of running airships and aeroplanes all over the country and all over the world." I do not say for a moment that those are not good objects in themselves if only we had the money for them, but when it comes to cutting in upon necessities in order to provide what, after all, at their best are conveniences, surely we should be committing a very great folly.

You would still have a heavy expense and it would not be an expense which would produce any intelligible result, but the defensive arrangements of the Empire would receive a crippling injury and they would be permanently relegated to a position the future of which would be at once very costly and wholly unscientific. In place of what you had lost there would no doubt be a gain. You would no doubt establish some very convenient and imposing air services by airships and aeroplane, communications would be improved, mails would be carried quicker, and a limited number of persons, who could afford to pay very high rates, would be carried and would be able to cross the world at unprecedented speed. I should very much like to see that done, I will do everything in my power to help that forward, but to say that such results are comparable to the solid and indispensable work done by the Royal Air Force in helping with the Army and Navy to defend our country and our Empire is an absurdity. You would throw away the one essential of your life in order to adopt what is undoubtedly a great convenience and an advance in civilisation.

Therefore I say it would be most unwise to break up the Air Force which has been slowly and carefully re-created. I have gone very carefully into the matter and I do not believe that you could possibly have an Air Force which would discharge the essential and vital naval and military duties of the Empire for less than £15,000,000 or £16,000,000 a year, that is to say, £7,000,000 or £8,000,000 a year at the pre-War value of money. The expense of the Air Force now, compared with pre-War, is not more than £8,000,000 or £9,000,000 sterling. You cannot have an Air Force for less than that, which is the very minimum. If there are to be great developments in civil aviation at Government expense the additional money must be voted by Parliament for that purpose. I should, of course, be delighted to receive from the House and from my right hon. friend the Chancellor of the Exchequer, larger sums of money for civil aviation, but in view of the grave financial stringency I do not feel justified in asking at present for more than the £1,000,000 a year which we are spending. Properly used, a great deal ought to be accomplished within the limits of this £1,000,000. We must do everything that is possible to help those who have it in hand. They have a very hard task to perform, and they have shown great courage and persistency and perseverance in their discharge of it. I think, however, that in view of the limited sum which is available it will be necessary to go on concentrating on a few routes and a few services to make sure that they are established and maintained, rather than to spread out your contributions on plans of a general character, not one of which can be carried more than half-way to success.

Last year the Admiralty reached the opinion that, as the need for economy was so great, we could not afford to develop both airships and aeroplanes for naval purposes, and that we had better give up the airships and concentrate on the aeroplanes. It was a melancholy decision, when you consider that, as a result of so much expenditure, we had reached almost the first place in the world in the construction of rigid airships. But I think it was a wise decision. It seems to me very probable that that will involve the abandonment by the Government of airship building in the civil sphere. We have hitherto been engaged in completing airships under construction when the War ended, in experimenting with those ships, and in building a new ship for the United States, for which we receive a sum of £500,000, owing to the enterprise and commercial activity of my right hon. friend, in training their crew in the handling of this ship, and in carrying out certain experiments with mooring masts which are of great interest and importance. Unless, however, within the next few weeks private companies are willing to come forward and take over the airships and run them for commercial purposes, I shall not feel justified in continuing expenditure upon airships for civil purposes. If any company will come forward and give a reasonable undertaking to operate the vessels and to continue to experiment, they shall have all our airships free of charge, together with all the spare parts in our possession and the necessary ground establishments. They can have them as a free gift, with any assistance that we can give, if they care to come forward.

The task of fostering civilian aviation in the British Isles will be attended with much difficulty. The fogs and mists and other climatic conditions are a terrible hindrance. Moreover, the country is covered by a network of railways and roads, which constitute a most formidable competition with the air. I think the Government might easily pour out very large sums of money with that object, without achieving any permanent result. There is, however, one route which we should keep open, and which certainly offers superior prospects of success. I mean the air route from London to Paris and the Continent generally. Here the British aeroplane, although still hampered by the weather conditions of these islands, has the enormous boon, the almost inestimable boon to bestow on a traveller, of eliminating the crossing of the Channel with its attendant delays and discomforts. It is not simply the inconvenience of the sea voyage which will be saved, but the long delay which takes place both before and after the passage. I cannot conceive that with a sustained effort to popularise this service it will not succeed, at any rate during the summer months. I think we should concentrate upon this now, when our funds are so limited, instead of dissipating our strength in enterprises which we may not be able to carry through.

The Chancellor of the Exchequer has accorded to the Air Ministry a very wide discretionary power in the spending of the £1,000,000 allocated to civil aviation, provided that the total is not exceeded and that no commitment is made which involves future increases on the £1,000,000. The sum of £60,000 is included in the Estimates for subsidies to civil aerial transport firms, and this was based on a scheme proposed by Lord Weir's Committee for subsidising such companies to the extent of 25 per cent. of their gross earnings. Now, however, that the French Government have decided to grant to their own companies assistance on a most generous scale, I fear that if we adhere to the scheme of Lord Weir's Committee our firms will be so heavily undercut that there will be no encouragement for British lines to continue. I propose, therefore, to set up immediately a Committee, including members of the aircraft industry and the aerial transport firms, to devise the necessary alternative methods which will meet these changed conditions, and to make proposals for immediate action. If a saving can be effected on other parts of the civil aviation Vote, the inducements we now offer will be made much greater. More than that I cannot say at present.

I am bound to deal with at least one further question. We are often asked, Is the Air Force to be simply an addition to the pre-War Army; is it an extra burden on the taxpayers of every country, or will it gradually become a substitute for an important portion both of the Army and the Fleet? There is no doubt that, properly handled and developed, the Air Force will become a substitute to a very important extent both for soldiers and ships. So far as the Army is concerned, we are convinced that the Air Force has it in its power at the present time very sensibly to reduce the



numbers and costs of the garrisons of certain Oriental territories for which we are at present responsible. We know that in the recent rebellion in Mesopotamia whole districts were prevented from rebellion by the mere fact that aeroplanes were seen cruising over those areas. So far as coast defence is concerned—the defence of naval ports and defence against invasion—there is no doubt that the Air Force can afford a real protection that will take the place of far more costly vessels necessary in the pre-War days. So far as the Navy is concerned, it is quite true that no sensible or well-informed person contemplates the Air Force being able in the next five or ten years to take the place of capital ships that have formed the British line of battle on sea. Harm is done when claims are made on behalf of the Air Force either in regard to maintaining order and security, unaided, alone, single-handed, in large disturbed countries or in regard to the prime defence of these islands and of our Empire on the sea. The Air Force can only at the present time act as a supplement, as an increasing supplement, but still only as a supplement to the Army and the Navy, but it should be a supplement which, from now onwards, should enable the number of types of warships to be reduced and considerable reductions to be effected in the number of troops we have hitherto employed in certain parts of the world. It may well be, for instance, that the capital ship will be increasingly watched and protected by aircraft in the future instead of by the larger number of small vessels, cruisers, destroyers, trawlers which have been found indispensable to its safety in the late War. It may well be that reconnaissance at sea by aircraft may be found a substitute for far more expensive types of sea-going ships. It may well be that the submarine will find in the aeroplane another of those deadly menaces which threaten to curtail its sinister intrusion into the foundations of our naval security. I do not wish to prejudge those matters. I am sure that to scrap and break up the Air Force which has been created laboriously, which has just reached the effective stage, would not only rob you of an essential and vital means of defence, but will also cut you off from the possibilities of future reductions in the other services through the substitution of air power for man power and for sea power, which reductions may indeed be an essential part of our future security.

I suppose I shall be asked to refer to the future of the Air Ministry. I can assure the House I shall be absolutely ready to hand over the seals of the Air Ministry at any moment that it may be found convenient to create a new Secretary of State for Air with a separate seat in the Cabinet. That is a matter to which I would raise no sort of obstacle of any kind, but so long as I am responsible for the Air Ministry the policy which I now submit to the House will continue in essentials, if the House supports me, to be what it has been during the last two years, that is to say, it will be first of all to spend £1,000,000 a year on civil aviation in whatever manner may be found best, but with particular regard to the importance of maintaining the Cross-Channel services. Secondly, to build up in all its details a properly combined efficient fighting service, a healthy, skilled, and well-disciplined body of officers and men; and, thirdly, to maintain a unified, separate, independent Air Force as a third and equal arm in the Service with the Army and the Navy, and to act continuously in close and harmonious co-operation and combination with them.

Maj.-Gen. Seely: There were many of us who thought that the combination of the offices of Secretary of State for Air and Secretary of State for War was an indefensible arrangement, but to say that a man could be Secretary of State for the Colonies and Secretary of State for Air at one and the same time, seems to be indefensible, comic, but it may be in the end somewhat tragic. We shall be discussing these Estimates tomorrow, and perhaps it is proper now to ask who will be replying for the Air Ministry tomorrow, when, as we understand, the right hon. gentleman is going off on his proper business to Egypt. Will he tell us who will be the representative of the Secretary of State for Air in this House?

Mr. Churchill: My right hon. friend the Joint Parliamentary Secretary (Capt. Guest).

Maj.-Gen. Seely: Let us see what exactly has happened as the result of the indefensible arrangement of the combination of the offices of Secretary of State for War and Secretary of State for Air, and we can then consider what will be the result of the comic and tragic position. The plan which the right hon. gentleman laid before the House when he first became Secretary of State for Air was that a certain sum should be expended in maintaining the military establishments, and he impressed this point, that the only way to really maintain a powerful Air Force was that it should rest upon a commercial industry in this country. General Sykes, Controller General of Civil Aviation, who speaks for the right hon. gentleman, said this not many months ago: "The nation which is strongest in commercial air traffic will be the strongest also in the cardinal warfare of the future." Thus we see clearly that the object of the right hon. gentleman was to maintain an adequate Air Force of a naval and military kind and, as General Sykes says, based upon a strong commercial aviation system in this country. All other countries concerned in this matter have taken the same view. What has happened? Would the House believe that when the right hon. gentleman was describing how well flying was going on, that this commercial traffic which he himself says through his own subordinate is absolutely essential to our national safety has not only decreased in volume but has from today absolutely disappeared. There is nothing left of it whatever. A year and a half ago there were many great concerns building aeroplanes and above all with their designing staffs all busily trying to find out the best way to conquer the air for peaceful purposes. We were told by the Controller General of Civil Aviation that so many hundreds of thousands of miles were flown—it was nearly a million—and providentially also hardly a life was lost. Now no miles are flown; no aeroplane leaves these shores; and the right hon. gentleman sits there with smug satisfaction and asks the House to give him this grant of £18,000,000 when the whole basis on which the fabric was to be created has absolutely vanished away.

When I resigned from the office which I held because of the fact that to attempt to do two things at once would mean failure, I never thought my prophecies would be justified so soon. I do not think any man, unfortunately, was ever so swiftly justified by events, for it is now the fact that the basis upon which the whole fabric of flying in this country was to be built up has absolutely disappeared. It all arises from the fact that a Government office must be controlled by a whole-time man. When I said that was necessary before, you did not believe it, but now you see it is true.

The Leader of the House had said that he did not agree with the theory that it was necessary to have "one man, one job," and that it was possible to combine offices without their coming to grief. That could not be so. In the Air Ministry decisions could not be obtained because Mr. Churchill could not give the time required to the daily meetings, and that was the reason why the whole basis of the right hon. gentleman's policy had disappeared, and we were left in the extraordinary position that this nation, who had most to gain and most to fear from aerial progress, who two years ago were in the forefront in every development, were now lagging behind all other nations. It was of vital importance to keep the industry going by fresh brains. The necessity of a strong Air Ministry had been stated very often by Mr. Churchill, and by the Leader of the House and the Prime Minister, and there were not two opinions about it. He supposed it would be admitted that all the skill, knowledge, and careful and industrious thought needed had practically disappeared.

Yesterday for the last time an English aeroplane left these shores. That ought to have been foreseen and could easily have been avoided. When

we were spending £200,000,000 or more on the armed forces of the country, was it not madness to allow civil aviation, which was the foundation of the newest and most important of all those forces, to disappear? He believed Mr. Churchill had done wonderful work for the country, and hoped that he would do so in the future; but if the right hon. gentleman did not devote his mind to one thing he would lead the country to disaster.

Col. Newman said: There is everything, apparently, included under Civil Aviation except flying. A couple of years ago it seemed as though we had the ball at our feet for those great far-distant aerial flights to India and Australia, and that we had established on a firm basis a service between London and Paris. That was two years ago. Today, the right hon. gentleman reminded this House that our last aerial service has closed down, unless it is revived again. What does that mean? It means that we lose the services of an enormous number of skilled pilots who are accustomed to fly in all weathers. We lose a great number of machines. We lose the chance of making improvements in a great number of machines, and we see it taken from us by other nations. France, with a heavily subsidised service, is going to take over a service from Paris to London and London to Paris, and I daresay hon. Members will have noticed that France only yesterday inaugurated a service from her shores to Casa Blanca, one of the chief ports in the Mediterranean.

I want closer co-operation between the Ministry of Air and our civilian air services, and our manufacturers of aeroplanes. I may be advocating a big change. I know it is a big change to have the present system torn up by the roots and turned into more of a territorial force, with a small established service capable of very quick and rapid extension, but for the main part my suggestion is that it should be based on what we call the territorial idea. That is a big change, and it is an ideal which it may be hard to reach. I am convinced, however, that if we were to put some scheme of that sort before the average patriotic ratepayer, and also allow the Air Minister to put his scheme forward at the same time, I am convinced that the taxpayer who wants to get the best value for his money would be inclined to take the scheme I suggest. The taxpayer grants to the Air Ministry money and the civilian air services and the manufacturers can and will give to the Air Ministry pilots, machines, and mechanics of the very best if a working agreement can be arrived at, and I trust it will be. Sir Charles Sykes once said that the nation which had supremacy in civilian time would have supremacy in military time. It is foolish to let down our civil flying and to look only to our military flying, and it would be much better to devote a certain part of this £19,000,000 to subsidise in the best way we can some of these aerial services which will be of so much use in the future.

Sir W. Joynson-Hicks: I wish to congratulate the right hon. gentleman upon the speech he has made showing the work which has been done by the military side of the Air Ministry. There are one or two points not of destructive but of constructive criticism which I should like to make. The right hon. gentleman raised a question of airships. It seems extraordinary that the whole of our airships are to be scrapped altogether and that the hangars, buildings and apparatus are to be handed over as a free gift to any company that likes to take them over. I wonder if the naval authorities have been consulted upon this matter. I know that when the airships were taken from the Navy and given to the Air Force a definite pledge was given that the future of all the naval officers would be thoroughly looked after by the Air Service. I want to know what is going to be done with those officers now.

I want to know also what we are going to do in the event of another war. If, in the event of the possibility of another war what are we going to do for airships? We have had the Report of the Battle of Jutland and other naval battles, from which it is clear that the Germans derived the greatest benefit by the observations made from Zeppelin airships on account of the enormous height, and the great radius of vision which those airships afforded. I want the Government to realise that the proposal for a separate Air Ministry was definitely considered by the Government, and it was thought to be so essential that the Government took the risk of altering the whole system in the middle of a great war, and they constituted them a separate Air Ministry.

At the recent Air Conference in London, where all the great air authorities were present, Air-Marshal Trenchard said: "One cannot look at a map of the world without seeing that Egypt is the centre of it from an aviation point of view." That is admitted on all hands by anyone who has had anything to do with the Air Service.

My right hon. friend is going out to Egypt, and, although we were told that he will have nothing to do with the future of Egypt, he is still responsible for dealing with Egypt from an air point of view, and I trust he will see for himself the vital importance of Egypt as an air centre, and I hope he will come back with such information as will determine the arrangement and the position of the Air Service, and that it will be employed and completely preserved. There has been a controversy in *The Times* on the question of "Big ships, or?" and when I dived into that correspondence I found that the Cabinet Committee appointed to go into this question had not anybody upon it qualified to consider this question of the future of the big ship and the torpedo.

Mr. Churchill: The Chief of the Air Staff and the Controller-General of Aviation gave the Committee full advice in regard to that matter in a long discussion.

Sir W. Joynson-Hicks: I am pleased to have elicited that statement because it has never been made public. Many of us who believe in the enormous possibility of an air attack have no idea that this position had been faced by Air-Marshal Trenchard before that Committee.

Sir Joynson-Hicks then having given details of the enormous developments in the Air Service, continued: I want to say a few words on the civil side of aviation. My right hon. friend, in his speech, seemed rather doubtful as to the future of civil aviation in this country, but if he really is doubtful, why should he keep this great organisation going? Here we have an Estimate for salaries of £178,000; £59,000 for stores and transport, £120,000 for technical equipment, £356,000 for building and lands, and £37,000 for petrol. Bearing in mind all these items, I cannot think civil aviation is in such danger as one might imagine. With regard to the petrol item, I confess I cannot understand the enormous expenditure on that account. I do not think the Department does very much flying. Still, the Estimate does show that much is being done on the civil side of aviation. If my right hon. friend is doubtful as to the future of civil aviation, why is he proposing to spend all this money on building hangars, buying petrol, and establishing meteorological stations, unless he intends to make civil aviation a possibility? Sir William then having detailed the European air routes under operation and planned, said: Situated, as we are, on an island, it is essential to us that we should retain the freedom of the air over foreign countries. It is no use our saying to any foreign country "You may not run a service over England," because the natural reply would be, "Very well, you keep to your own island; you shall not run an English service across our country." It is vital to our future in the air that we should retain by agreement with foreign countries the right of running air services across them.

It is humiliating to find that there is more than a possibility—a very great probability—of a German air service running across England in this way, while we here in England have no commercial air service at all. Mr. Handley Page and Mr. Holt Thomas have, as we know, done their best to keep going. I am told that a few months ago a few commercial machine



was evolved, the D.H. 18, but my right hon. friend has not given an order for one. During the War we said over and over again that the essential of an Air Service is that you should keep your factories in existence. You cannot institute factories by the wave of a magician's wand. You cannot get back the designers and staff necessary for making aeroplanes or air engines. You must keep your factories going. Ours have almost disappeared. Mr. Holt Thomas's is practically gone. Shorts, who made naval machines, are now making omnibuses, and have practically stopped doing air work. Sopwiths were broken up some few months ago, and eight of their best men, including the chief designer and the assistant works manager, have been taken over by Japan. They have gone there, and are working for the Japanese Government, which, I may say, is spending far more money on aviation than we are.

I am as strongly convinced as ever that the future success of any country in war will be in the air. Whether the success will be Great Britain's will depend entirely upon how the leaders of thought in the Cabinet deal with this matter. I plead for civil aviation, not merely because I think it would be fatal to have no civil aviation lines while other countries have them, but because it will provide a reserve in personnel and on the factory side of aviation for our military aviation when we want to increase it. It cannot be increased on an emergency unless there are the factories and the reserves of men. If we had ample civilian air services, the pilots would provide an ample reserve for military aviation, and could be called upon in a time of sudden emergency to fill up the ranks of the military air service. If, however, you have no civilian air service today, if your men are going to Japan and your factories are shut up, how are you going to expand?

I really do not think that any more money is necessary. We are spending £1,000,000 on civil aviation, and £880,000 of that is being spent on organisation, staff, meteorology, and so forth. What is the good of it unless you have some air routes? I have been against subsidies, but I have been forced, such is the position of the Air Service, to change my views, and say quite frankly that I cannot see how, for the next year or two, we are to have a commercial air service without some subsidy.

Rear-Admiral Adair: I associate myself with what was said by Sir W. Joynson-Hicks as to the lack of development and experiment in connection with the Naval Air Force. I believe that if it had been dealt with by the Admiralty, its development would have been greater.

Mr. Moseley: The question I desire to dispute in these Estimates lies in the realm of civil aviation and research. We find that over and above the amount spent last year there is an increase of £336,320 in the amount devoted to civil aviation and research, while on the military and mechanical side there is an increase of £1,615,450. I only wish some of the increase in the military expenditure could have been devoted to the more vital side of civil aviation. That desire is enhanced when one studies the figures prevailing in France in this connection. France this year is allowing £3,400,000 to civil aviation at the present exchange—on the real exchange, of course, about £7,000,000. £600,000 is devoted to aerial transport. In this country the whole amount devoted to civil aviation is £880,000, while to aerial transport you are allocating the piteous sum of £60,000, with the result that now all the private companies in this country have been forced to close down.

But even more serious than that is the fact that, compared with our great expenditure on the immediate military demands of the moment, we have allocated a very small sum indeed to experimental and research services. Under research we find only £1,835,000. That really is the crux of the whole situation. After all, aerial matters are in their infancy. Types change from day to day. Far more swift than changes in the construction of battleships are changes in the construction of aeroplanes. Types become obsolete far more quickly. So in the light of these considerations, the ever-changing character of aerial discovery and aerial development, what is the use of expending our money on the immediate situation and starving research, which at any moment may throw out a new type which will not only render all existing aeroplanes entirely obsolete, but may revolutionise naval and military warfare? Surely it cannot be impressed too strongly that this side of research, in the case of a science which is in its infancy, is everything. Compared with that nothing matters to anything like the same degree. I deplore most strongly not only the right hon. gentleman's utter failure to keep going civil aviation, on which in former days he informed us he intended to base the whole aerial power of the country, but the entire failure to allocate a proper sum or make proper provision for aerial research. I beg the right hon. gentleman to turn his attention for a moment from the prospects of the next war to the immediate prospects of developing civil aviation and a research department by the aid of which in the future we might very possibly

retain an aerial supremacy commensurate with that which we have maintained in the past.

Mr. Dennis said that during the war we were never supreme in the air. We were superior, but not supreme in the air. What is the present constitution of the Air Force? It is the very minimum that can possibly be provided, and simply on account of the present craze for economy. Economy is vital. Let us have economy by all means, but economy at the expense of national safety is a crime, or very near it. We have an irreducible minimum Air Force at the present time. It is totally inadequate for war.

What would happen if we were plunged into another war in the next few years? How would the right hon. gentleman expand the Air Force? From what quarter would he draw his reserves? Can he answer that question? I shall be very much surprised if he can, unless he answers it in this way: that he would look to the creation of a large and successful mercantile air fleet in the same way that the Navy looked upon our immense mercantile marine, which comprised more than one-half of the total tonnage of the world, as the source from which to draw good men. Without them where should we get our reserve of pilots, our mechanics, our designers, our factories ready to produce the large amount of aeroplanes that would be required?

Mr. Churchill says in connection with the Air Force that there are no fewer than 54 industries to be studied and practised and employed, and the amount of scientific knowledge that has to be brought to bear he describes as being very great. Every argument that he put forward with regard to the fighting force applies equally to the commercial air force. Those 54 industries will be all required for the commercial air force, and in those industries you will have the means in time of war, which may be sooner than the right hon. gentleman or the country expects, of expanding the Air Force, and in that you will have a large reserve.

I wish that we could have a commercial air fleet which would provide a proper reserve for the defence of the country. Let us have if necessary a Supplementary Estimate for the purpose which I have mentioned. I say this because the Air Force is the most economical force which we can have. The right hon. gentleman has admitted that it saves an enormous number of troops in the field, particularly in countries like Mesopotamia and India. So we might very well commend it to the country on the ground of economy.

Lieut.-Com. Kenworthy said: I am sorry that an hon. and gallant Member talks of the naval wing dropping off the bird of the Air Ministry and being taken up by the Admiralty. I hope there is no such intention. If the Air Service gets once more under the deadening hand of the Admiralty, Heaven help them! The Admiralty will strangle development, and to take this step would be to take the most retrograde step possible. The future of flying for the next few years will depend, as regards sea warfare, on efficient carriers. Owing to the short range of action of seaplanes, you have to rely on the right type of carrier.

The question of civil aviation has been dealt with very fully. I regret also that last year we managed to save £500,000, which was voted by this House for civil aviation, but owing to neglect of some sort was not applied to that purpose, with the fatal result that we see today in the closing down of so many aeroplane firms.

Mr. Churchill, in reply, said that the tenor of nearly all the speeches has been a reproach of the Government for not spending more money on the air, either in its military or its civil branch. Some have wished for a different allocation between one branch and another. Sir W. Joynson-Hicks wishes for a different allocation which would facilitate further the development of civil aviation without in any way prejudicing the importance of military aviation. That means, I presume, that he would be in favour of spending more money.

Sir W. Joynson-Hicks: I referred to the fact that £880,000 has been spent on civil aviation and a great deal of it on bricks and mortar. It was the better allocation of that sum for which I asked.

Mr. Churchill: With the one exception of my hon. friend it is quite true that the general trend of the comments during the debate was criticism because we are not doing more.

Mr. Bonar Law, in regard to a full discussion upon the return of the Air Minister from Egypt, said: I would make the suggestion that, after the comparative short discussion which we have had, if the Committee will give us Vote A and Vote 1 now I will undertake as soon as possible after the return of my right hon. friend to give a day for the complete discussion of Vote 1, when the whole subject can be gone into in the presence of my right hon. friend. I think that is doing everything we can do to meet the convenience and wishes of the House, and I hope they will consider it reasonable.

To which the House agreed.

# THE ROYAL AIR FORCE

London Gazette, March 1

## Permanent Commissions

The following are granted permanent commissions with effect from the dates indicated, retaining their present rank and seniority, except where otherwise stated. *Gazettes* of dates indicated, appointing these officers to short service commissions, are cancelled:—

*Flt.-Lieut.*—D. Stewart, M.C., A.F.C.; Oct. 24, 1919. Since promoted.  
*Flying Officers*.—H. N. Hampton, D.F.C.; Oct. 24, 1919. L. N. Hollinghurst, D.F.C.; Dec. 12, 1919. R. W. G. West; Sept. 16, 1919.  
*Flying Offr.* W. E. Theak is granted a permanent commn. in the rank stated, retaining his original sen.; May 28, 1920. *Gazette* of June 8, 1920, appointing this officer to a short service commn., is cancelled.

The following *Flying Officers* are restored to the active lists from half-pay:—C. L. King; March 4. W. M. Yool; Feb. 15.

*Flying offr.* E. E. Turner, D.F.C., is placed on half-pay, Scale B, from Feb. 5 to Feb. 10 inclusive (substituted for *Gazette*, Feb. 18). Observer Offr. P. C. Campbell-Martin, M.C., is dismissed the Service by sentence of General Court-Martial; Jan. 5. *Flt.-Lieut.* R. G. Mack relinquishes his permanent commn. on account of ill-health contracted in the Service, and is permitted to retain the rank of Capt.; Feb. 19.

## Stores Branch

*Flying Offr.* L. H. Vernon is granted a permanent commn., retaining his present rank and sen.; June 17, 1920. *Flying Offr.* F. J. Cooke is granted a permanent commn., retaining his present rank and sen.; June 17, 1920. *Gazette*, Jan. 28, appointing this officer to a short service commn., is cancelled. *Flying Offr.* J. Baxter is placed on the retired list; Feb. 26.

## Short Service Commissions

The following are granted short service commissions, with effect from the dates indicated, retaining their present rank and sen.:—*Flying Officers*.—S. E. Adams; Feb. 1 (substituted for *Gazette* Feb. 15).

G. R. Burge; Feb. 10. E. A. Locke-Waters; Feb. 17. H. D. O'Neill, A.F.C.; Aug. 1, 1919 (for three years on the active list).

## Re-seconding

*Gazette*, Apr. 27, 1920, re-seconding *Flying Offr.* H. D. O'Neill, A.F.C., to the R.A.F., for two years, is cancelled.

## Flying Branch

The following relinquish their temp. commns. on appointment to T.F. Reserve, and are permitted to retain the rank of Lieut.:—Lieut. R. W. L. Thompson; Sec. Lieut. (Hon. Lieut.) E. Lawson.

## Administrative Branch

Lieut. B. W. Blower relinquishes his temp. commn. on appt. to T.F. Res., and is permitted to retain his rank. Sec. Lieut. H. Davies relinquishes his temp. commn. on ceasing to be empld.; Aug. 10, 1918. *Gazette*, Jan. 24, 1919, relating to this officer, is cancelled.

## Technical Branch

Capt. K. D. Abercromby relinquishes his temp. commn. on appt. to T.F. and is granted the rank of Maj. *Gazette*, June 18, 1920, relating to Maj. (actg. Lieut.-Col.) J. G. Bayes, O.B.E., is cancelled. *Gazette*, March 2, 1920, stands.

## Memoranda

Four Cds. are granted hon. commns. as Sec. Lieuts., with effect from the date of their demobilisation.

London Gazette, March 4

## Flying Branch

Lieut. (actg. Capt.) W. H. Demel, D.F.C., relinquishes his temp. commn. on appointment to T.F., and is permitted to retain the rank of Capt. Lieut. V. M. C. B. de Sarigny relinquishes his temp. commn. on appointment to a commn. in the Army (June 2, 1920): substituted for *Gazettes*, May 21, 1920, and Aug. 13, 1920.



## THE D.H. CANTILEVER MONOPLANES

FOR some time now work has been progressing rapidly at the new Stag Lane works of the de Havilland Aircraft Co., on the two cantilever wing monoplanes ordered by the Air Ministry. Owing to the confidential nature of the work we have hitherto refrained from mentioning anything about these machines, but as the daily press has started talking it may be as well to put on record briefly what the new machines will be, although detailed references would not at present be advisable. The machines, which will be fitted with one 450 h.p. Napier "Lion" each, have their fuselage of three-ply construction, with a pronounced "tumble home" to the sides so as to get a wide base for the attachment of the undercarriage struts. There will be a very large cabin which can be used for a variety of purposes, such as wireless experiments, photography, etc. If designed for commercial use, the cabin would, of course, accommodate the passengers.

The wings, as already mentioned, will be of the cantilever type, and it is worthy of note that in wind channel tests of a

scale model it was found that results were obtained which were better than those of the ordinary wings with their bracing. Naturally it is not permissible to give figures, but there seems to be ample proof that the cantilever wing is not nearly as black, aerodynamically, as it has been painted. At present the construction of the wings is being thoroughly tested out, and some very good results have been obtained, quite high factors having been attained with the form of spar construction which will be used. Again details are not permissible.

It may be remembered that in the paper read before the Air Conference last year, Mr. H. White Smith gave in tabular form the cost of running various types of machines, among which the D.H. 18 came out most economical. With the new machines it is hoped to attain even better efficiency, although being of an entirely new type this is more or less of an estimate. The machines are frankly experimental, but are certainly very promising.

### At Buckingham Palace

AMONGST those present at the afternoon party given by the King and Queen at Buckingham Palace on Thursday, March 3, were Wing-Commander R. G. Blomfield, Wing-Commander and Mrs. G. R. Bromet, Air-Commodore C. A. H. Longcroft, Group-Captain C. L. N. Newall, Squadron-Leader L. A. Pattinson, etc.

### At the King's Levee

AT the Levee held by H.M. the King on Monday, March 7, at St. James's Palace, the following were present:—Squadron-Leader G. B. Dacre, D.S.O.; Wing-Comdr. A. L. Godman, C.M.G., D.S.O.; Air-Commodore C. A. H. Longcroft, C.M.G., D.S.O., M.C.; Group-Capt. C. L. N. Newall, C.M.G., C.B.E., A.M.; and Wing-Comdr. C. R. J. Randall, C.B.E.

Amongst those presented to the King were Flight-Lieut. L. M. Bailey, A.F.C.; Flight-Lieut. A. G. Bishop, A.F.C.; Squadron-Leader G. F. Breese, D.S.C.; Flying Officer R. K. Daly, D.S.C., D.F.C.; Squadron-Leader the Hon. L. Twistleton-Wykeham-Fiennes; Flight-Lieut. J. O. Groves; Capt. B. C. Jones, R.A.F.; Flight-Lieut. H. S. Kerby, D.S.C., A.F.C.; Flight-Lieut. R. F. S. Leslie, D.S.C., D.F.C., A.F.C.; Flight-Lieut. R. St. C. McClintock, M.C.; Flight-Lieut. C. O. Modin, D.S.C.; Flying Officer H. D. O'Neill, A.F.C.; Flight-Lieut. R. Gambier-Parry; Flying Officer T. A. Langford-Sainsbury, A.F.C.; and Flight-Lieut. E. N. E. Waldron.

### R.A.F. Rout the Army

KING GEORGE watched the R.A.F. last Saturday at Queen's Club give a bad trouncing to the Army Rugby team when the Air scored a big win over their opponents, the final score giving 5 goals, of which one was a penalty goal, and a try to one try—in all 26 points to 3. The play of the day only shows how deceived the most expert prophets can be. Never for a moment did the Army anticipate defeat. And possibly in that fact may be sought the unexpected score upon score which fell to the R.A.F. men. From the first kick-off the latter practically had it all their own way, in spite of the most spirited work of the Army. It was not until fully an hour and a quarter had passed that the Army got in their first score, a very finely secured try. Outstanding players in the R.A.F. Team were W. W. Wakefield, G. H. Maxwell, C. N. Lowe, G. M. Thomas, J. Russell and J. I. T. Jones. Throughout the play was fine, and probably there was no more appreciative follower of the niceties of the day's sport than the King himself. Congratulations to the R.A.F.

On Monday the R.A.F. scored another success against the Army in the annual "Soccer" game at Stamford Bridge. Here, with the Duke of York as spectator, the R.A.F. put up at the finish four goals to two. Those whose work told most were Wash, Barry, Pakenham-Walsh and Ayres.

### Spain and the Allies' Aircraft

A SPANISH Royal Order of February 7, 1921, gives authority for a commission of officers, under Capt. Cardona, Royal Spanish Navy, to proceed to France and Italy to complete negotiations for the purchase of material and to be present at the trials of lighter-than-air craft which have been purchased in the latter country. On completion of these duties the Chief of the Mission is authorised to proceed to England for the purpose of arranging the transport to Spain of British material which has been acquired.

### Copenhagen Service Doubtful

ACCORDING to *The Times* Copenhagen correspondent, regular international air traffic from Copenhagen will not be

resumed this spring, the Danish company only intending to send aeroplanes farther than Scandinavia when specially ordered. The explanation given is that the British company concerned has given up the service for lack of Government support, while the Germans maintain that the regulations of the Allied Military Mission prevent their airmen from going abroad.

### A Bellanca Five-Seater Monoplane

GIUSEPPE M. BELLANCA, who designed and built in America the efficient little single- and two-seater biplanes bearing his name, has just completed the designs of a five-seater monoplane, for which is claimed a somewhat remarkable performance, considering that the machine is fitted with a motor of only 95 h.p. Detailed particulars are not yet to hand, but apparently the machine is fitted with cantilever wings, as it is stated that a high degree of efficiency has been achieved by eliminating to a great extent parasite resistance, practically all the resistance being confined to the well streamlined body and simple landing gear; there are no external bracing wires. Thus with a loading of 6.95 lbs. per sq. ft., and 20.5 lbs. per h.p. (the weight of the machine loaded being 1,950 lbs., and the area 280 sq. ft.), a speed range of 42-108 m.p.h. is obtained, whilst it is claimed that the minimum h.p. required for horizontal flight is only 30 with full load, or 12 with light load.

The passengers are located in a luxuriously upholstered cabin in such a position as to allow the machine to be flown either with pilot alone or full load. The engine is a 10-cylindered Anzani, and sufficient fuel is carried for a flight of just under 600 miles.

We await further particulars of this machine with interest.

### The Dutch N.A.V.O. 6

A CORRESPONDENT in Holland writes to us pointing out that the initial letters of the firm which built the monoplane limousine described in *FLIGHT* recently are N.A.V.O. (Nederlandsche Automobielen & Vliegtuigen Onderneming), and that their address should have been given as *te Kuick, Maas, Holland*.

### Japan in Real Earnest

THERE is little doubt that Japan is grasping the idea of aviation with both hands. That island country is certainly wide awake to its future, judging by its practical methods of acquiring craft and knowledge. A mission is being sent out from here to Japan, with the Master of Sempill at its head, to help our ally in the flying and technique of the aircraft she has acquired. Mr. Oswald Short is also working with the Japanese Government in connection with flying boats, and has taken with him for the purpose some thirty of his Rochester Works experts. We have not heard whether they propose making a bid to relieve us of our dual-headed Air Minister.

### A Vickers "Blimp" for Japan

THE "Blimp" airship, upon which Messrs. Vickers, Ltd., have been engaged at Barrow some time for the Japanese Government, is now practically ready to take the air. Her trials will very shortly be undertaken.

### China's Air Enterprise

So well pleased is China with the result of the flying experiments so far introduced, that she is credited with the intention of shortly authorising an expenditure of some 500 millions of francs in further extension of her air plans. About 300 millions of this is to be ear-marked for commercial aviation. In time, therefore, we might easily have air-services running here manned by Celestial pilots.

# ROYAL AERONAUTICAL SOCIETY



**Lecture.**—The last lecture of the session will take place on March 17 at the Royal Society of Arts at 5.30 p.m., when Capt. D. Nicolson, M.I.N.A., Associate Fellow, will read a paper on "Flying-Boat Construction."  
**Wilbur Wright Lecture.**—The Annual Wilbur Wright Lecture will be delivered by Major G. I. Taylor. The title of the paper and date, which will be towards the end of April, will be announced later.

**Donations.**—The Council desire gratefully to acknowledge the gift of lantern slides for the Society's loan collection from the Westland Aircraft Works.

W. LOCKWOOD MARSH,  
Secretary

## Lectures at the Royal Aeronautical Society

ON March 3 two papers were read before the Royal Aeronautical Society. One was by Major T. Orde Lees, and was entitled "Saving Life in Air Wrecks." The other was read by Mr. J. W. W. Dyer, and was on the subject of "Airship Fabrics." In the main, Major Orde Lees' paper was similar to that read before the Cambridge University Aeronautical Society recently, which has already been published in *FLIGHT*. It dealt with parachutes and their functioning, and set out to prove that the carrying of parachutes on commercial aeroplanes should be made compulsory. One of the inducements to carrying parachutes was given as a reduction in personal insurance premiums already offered by certain insurance companies. Mr. Dyer's paper on Airship Fabrics was very interesting, but as it consisted to a great extent of tables and data, we have been unable to find space to publish it. All those interested should obtain a copy of the Society's Journal.

## Cambridge University Aeronautical Club

A GENERAL meeting of the Cambridge University Aeronautical Club was held in the Examination Hall, Free School Lane, on March 2, when the officers for the year 1921-1922 were elected, and an interesting lecture was given by Mr. S. E. Taylor (Corpus Christi) on "Non-Rigids during the War." The lecture was illustrated with slides taken chiefly from the speaker's own camera. Mr. Taylor is the only airship pilot in the Club.

In the unavoidable absence of the President (Mr. H. A. Mattam, Trinity), Mr. O. E. Simmonds (Magdalene), hon. secretary, presided, and briefly outlined the progress of the club. At the commencement of the year, he said, their membership was 128, and at the moment it was something over 300. He thought they could consider this very satisfactory for a society which, after all, only had a specialised sense of interest to most people "up" here. Negotiations had been proceeding as to the possibilities of an Inter-Varsity Air Race this summer, and he had been in communication with the Royal Aero Club, who were anxious to give them what support they could. Oxford were greatly handicapped, because at the moment flying was definitely banned, but the speaker hoped soon that they would be able definitely to announce that the race would take place.

The election of officers was then proceeded with. Sir Zuinton Grand, of Peterhouse, was unanimously elected President of the club. The election of hon. secretary was left in the hands of the committee. The members elected on the committee were Messrs. J. C. Griffiths (Christ's), G. L. Newman (Christ's), H. A. Mettam (Trinity), E. T. D. Townsend (Jesus), C. J. Funnell (Sidney).

## Air Service Excess Spending

THE Committee of Public Accounts report that the sum required to be voted to make good excesses for the Air Services for the year ended March 31, 1920, is £251,214 18s. 5d. The estimate amounted to £56,035,950, and the actual expenditure exceeded the estimate by £578,666 8s. 1d. The surplus on actual appropriations-in-aid amounted to £327,451 9s. 8d., leaving the sum stated to be voted. The Committee see no objection to the excess vote.

## IN BANKRUPTCY

Re Charles Ralph Shortt, Engineer, Sandown, Isle of Wight

AT the public examination of the debtor in the Isle of Wight Bankruptcy Court last week, expenditure of nearly £2,000 on a patent relating to a metallic outer cover for rigid airships and aeroplanes was given among the causes of the failure. The debtor said that practically his whole life had been devoted to that invention. He was formerly in the Royal Air Force.

## PUBLICATIONS RECEIVED

*Proceedings of the Air Conference, 1920, with Appendices.* London: H.M. Stationery Office. Price 2s. 6d. net.

*L'Impiego dei Dirigibili nei Trasporti di Passeggeri.* By Ing Umberto Nobile. Giornale del Genio Civile, Via Torre Argentina, 47, Rome.

*Technical Note No. 34. The 300 h.p. Benz Aircraft Engine.* By Dr. A. Helier. National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

*Technical Note No. 35. The Optical Wing Aligning Device of the Langley Field Tunnel.* By F. H. Norton and D. L. Bacon. National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

*Technical Note No. 36. N.A.C.A. Langley Field Wind Tunnel Apparatus; The Tilting Manometer.* By F. H. Norton and D. L. Bacon. National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

*Technical Note No. 37. The Determination of the Effective Resistance of a Spindle Supporting a Model Aerofoil.* National Advisory Committee for Aeronautics, Navy Building Washington, D.C., U.S.A.

*Technical Note No. 38. Measurements of Rudder Moments on an Airplane During Flight.* By Ing. V. Heidelberg. The National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

*Technical Note No. 40. Effect of the Reversal of Air Flow upon the Discharge Coefficient of Dürley Orifices.* By Marsden Ware. National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

*Technical Note No. 42. The Determination of Downwash.* By Lieut. Walter S. Diehl. National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

## AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

### APPLIED FOR IN 1918

Published March 10, 1921

558. H. E. S. HOLT. Parachute flares. (158,580.)

### APPLIED FOR IN 1919

Published March 10, 1921

- 24,705. J. F. PONT. Rotary I.C. engines. (138,062.)
- 24,741. M. ZANG. Parachutes. (158,608.)
- 27,268. T. G. NYBORG. Control of aeroplanes. (158,631.)
- 27,361. R. J. KING. Ribs, spars, etc. (158,637.)
- 27,413. O. E. MESSTER. Production of photographs from aircraft. (134,851.)
- 27,482. C. MATTHEWS and C. S. HALL. Aeroplanes. (135,176.)
- 27,603. G. F. BUCKLE and F. PARFETT. Course-indicators. (158,672.)
- 27,912. C. A. WRAGG. Aerofoils. (135,829.)
- 28,708. R. P. PESCARA. Screw propellers, etc. (158,732.)
- 30,927. BOULTON AND PAUL, LTD., and J. D. NORTH. Securing engine plates to aircraft. (158,766.)

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages xiii and xiv).

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